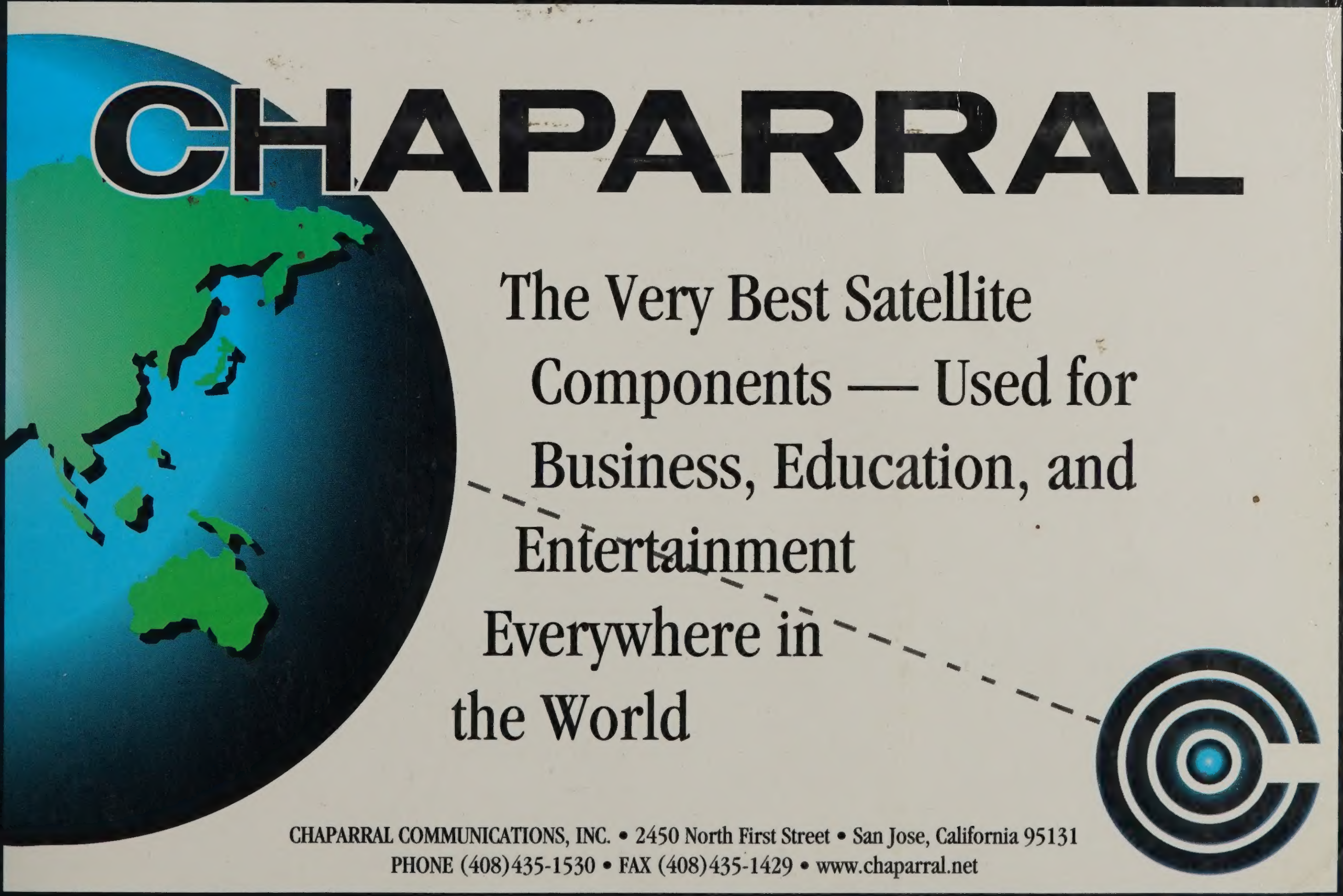
1997

Phillips

Ninth Edition

World Satellite Almanac™



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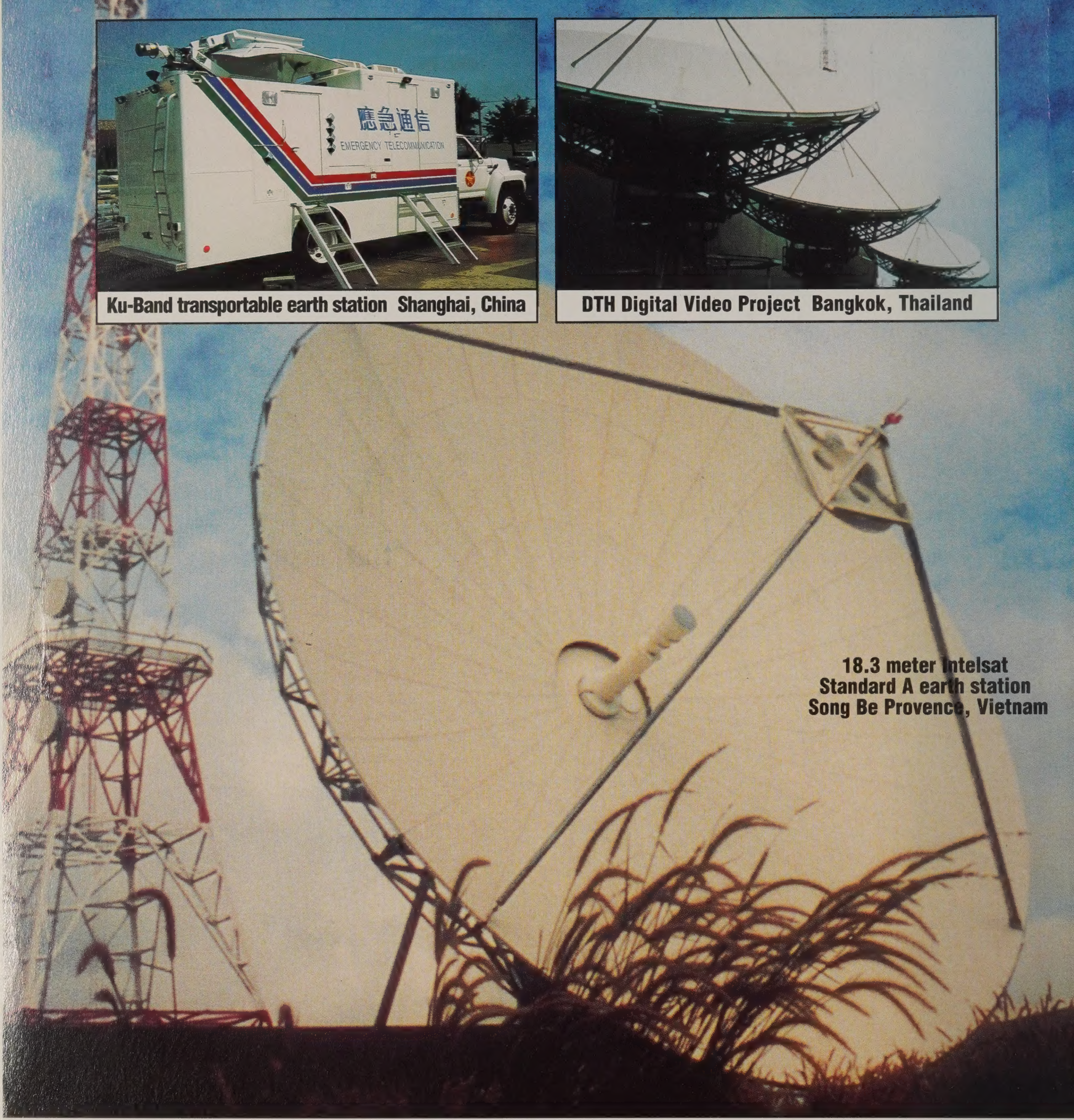

Ku-Band transportable earth station Shanghai, China

DTH Digital Video Project Bangkok, Thailand

18.3 meter Intelsat
Standard A earth station
Song Be Provence, Vietnam

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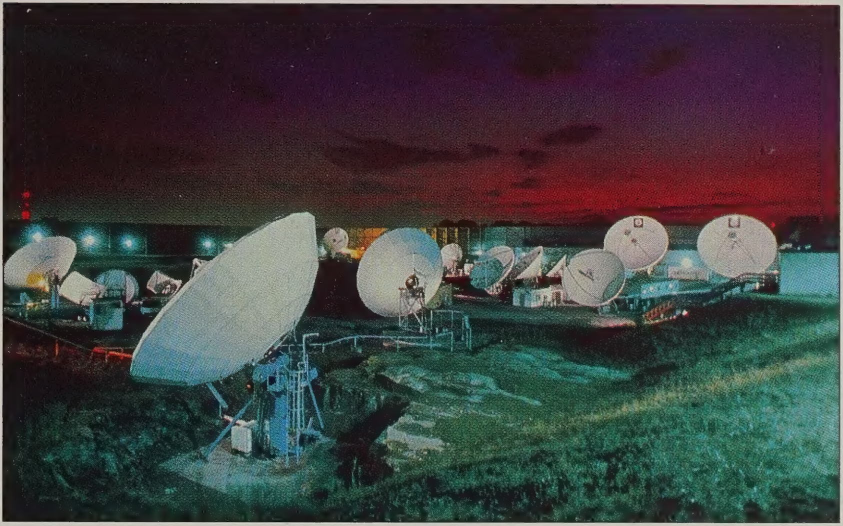
IDB Systems: User...Supplier...Innovator



WorldCom's Staten Island earth station, designed and installed by IDB Systems.

Finding an earth station that will facilitate communications and open gateways for entire countries is no easy task, unless you know to call IDB Systems.

IDB Systems, a division of WorldCom Inc., offers communication solutions via all international and domestic satellites, including full-feature flyaway and rapid deployment earth station terminals, design, and construction of fixed earth stations, mobile earth stations and customized options from initial design to post installation. Clearly, IDB Systems has the global edge in satellite technology.

The majority of IDB Systems' customers are based outside the United States and mostly comprise foreign telephone companies, PTTs and broadcasters. “Over 80 percent of our business is outside the United States,” says Chris Morris, Vice President of Sales/Marketing. “Thirty-five percent of the company's overall business is in Asia, and roughly 25 percent of it is Europe. The rest of our international business is spread over the CIS, Africa and Latin America.”

IDB Systems provides a number of services for its customers. The company completes full testing of the earth station and peripheral equipment, certifies the stations for Intelsat, fully installs all components and upgrades old antennas.

IDB Systems has been designing, engineering, integrating and installing satellite earth station facilities since 1983. From the genius of the state-of-the-art Monitor and Control Systems (MACS) and superior systems integration and customization, to flexible designs and configuration, IDB Systems engineers are at the cutting edge of technology providing tomorrow's innovations today.

IDB Systems' full-feature flyaway and rapid deployment earth satellite terminals represent the ultimate in rugged, cost effective systems designed specifically to meet the needs of emergency situations under adverse conditions. Available for sale, lease, or custom built to exact specifications, IDB Systems can offer deployment quickly and easily in just hours...minutes for the company's smaller terminals.

Not only is IDB Systems a manufacturer and supplier of earth stations, the company relies on earth station technology 24 hours a day. IDB Systems is a subsidiary of WorldCom Inc., the fourth largest long-distance carrier in the United States. “We have the experience needed for customers looking for earth stations,” says Morris. “We run our earth stations 24 hours a day. We utilize earth station monitors, control systems, protection switches and various software and hardware.”

WorldCom and MFS Communications Co. Inc. announced on August 26 that the two companies have executed a definitive agreement and plan of merger. The combination, one of the largest mergers in U.S. corporate history, will create one of the world's premier business communications companies. The new company, to be called MFS WorldCom, will provide a single source for a full range of local, long distance, Internet and international service utilizing its fiber optic network and its international satellite capability.

IDB Systems understands that the whole is only as strong as its parts. IDB Systems' unique approach to servicing its clients is that it finds the best parts available and puts them together for the highest-quality product possible.

“We are an integrator,” says Morris. “We know who makes the best modems, amplifiers and antennas, and we put it together to create a superior solution that satisfies our customers' needs.”

Most recently, IDB Systems signed an agreement to provide state-of-the-art digital satellite technology for Bangkok Broadcasting Television (BBTV) to support coverage of news events throughout Thailand. The $3.3 million contract includes equipping three mobile vans with digital satellite networking technology and converting 10 of BBTV's 2.4-meter remote satellite stations to digital technology. Last year, IDB Systems installed a 9-meter Ku-band Hub Station and 35 remote satellite receiving stations across Thailand for BBTV.

By providing an impressive selection of options and competitive pricing, IDB Systems has created a flexible approach to providing the finest telecommunications services available. Whether a customer's needs involve purchase, leasing, custom building or upgrading existing equipment, IDB Systems offers timely and cost-effective solutions. This ability to provide the exact technology and expertise for specific requirements is what sets IDB Systems apart from the crowd, and at the forefront of global communications.

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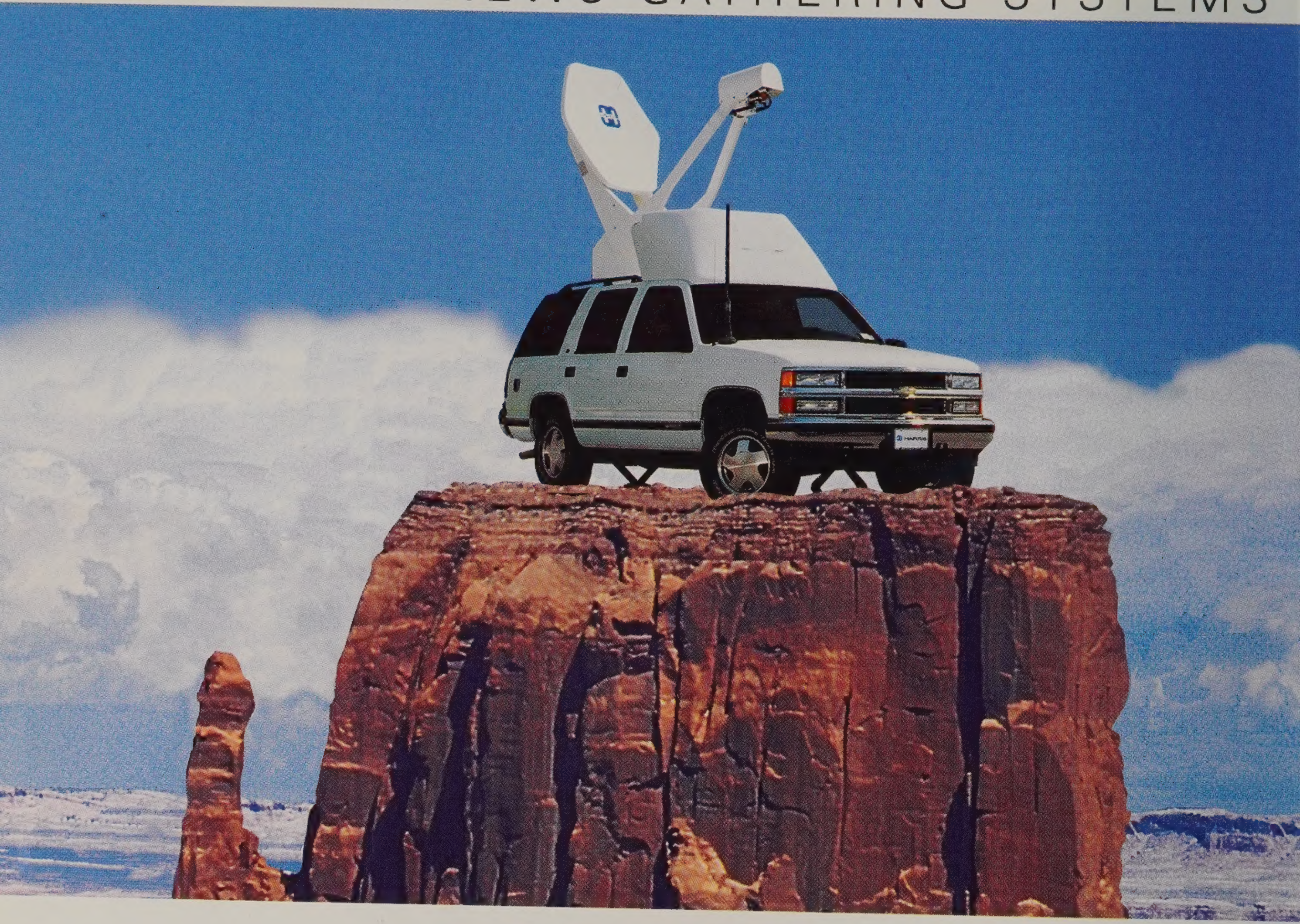

S-15 4x4 DSNG
Because the road to a hot story may not be a road.

Digital satellite news gathering has risen to new heights with the introduction of the Harris S-15 DSNG Vehicle. Built on a versatile 4x4 sport utility chassis, the S-15 can take your news crew virtually anywhere, in any weather, rapidly and securely.

An under-the-hood 5 kW generator gives them the power to set up on the run, so you can be on the air moments after arrival, and long before your competition.

An S-15 DSNG Vehicle contains everything you need, including a Ku-band uplink, satellite monitoring and control, switching and monitoring systems, audio and video equipment, and videotape units. The lightweight, high-performance, 1.2 meter antenna folds behind an aerodynamic cowling for high-speed highway travel, and raises automatically on command.

The on-board, DVB Interoperable, Harris DSE1400 Digital Satellite Television Exciter provides money-saving broadcast efficiencies which may make the S-15 the most economical choice of all.

With a low height of just over 8 feet, this standard weight-class passenger vehicle can carry a crew of three without needing a special motor vehicle license.

Over 500 years of Harris team experience in design and integration, with unrestricted customizing as the rule, means that your S-15 DSNG system can be anything you want it to be, as it takes you anywhere you want to go.

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Ninth Edition

1997

Phillips

World Satellite Almanac™

Phillips Business Information, Inc.

Phillips 1997 World Satellite Almanac™

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FOREWORD

Welcome to the ninth edition of *Phillips World Satellite Almanac.* The *Almanac* is your complete technical reference for the satellite communications industry containing up-to-date information on satellite operators; transponder frequency plans; coverage maps; transponder brokers and resellers; telecommunications policy and regulatory organizations; technical and demographic information on over 500 countries, territories and islands; and essential reference data, all presented to you in a user-friendly format.

We hope that *Phillips 1997 Phillips World Satellite Almanac* will serve as your most valued reference source to satellite operations worldwide, along with its companion, *Phillips Satellite Industry Directory* (formerly the *World Satellite Directory*), now in its 19th edition.

Phillips World Satellite Almanac is published by Phillips Business Information, Inc., the leading publisher of satellite publications and information services, including *Via Satellite, Satellite News, Mobile Satellite News, GPS Report, Phillips Satellite Industry Directory, Phillips European Satellite Directory, Phillips Asia-Pacific Satellite Industry Directory, Phillips Latin American Satellite Industry Directory,* and *Satellite on CD.* Phillips Business Information, Inc. also sponsors the *Satellite '98* conference and the *Introduction to Satellite Technology* seminars.

Information in the *Almanac* was furnished by the organizations listed and is believed to be accurate. Phillips Business Information, Inc. cannot accept responsibility for inaccuracies, omissions or claims made by companies listed.

Phillips Business Information, Inc. welcomes your comments about all aspects of this edition of *Phillips World Satellite Almanac.* If after using the *Almanac* you have any suggestions on how we could make it better, more complete and more useful, please direct your comments and suggestions to:

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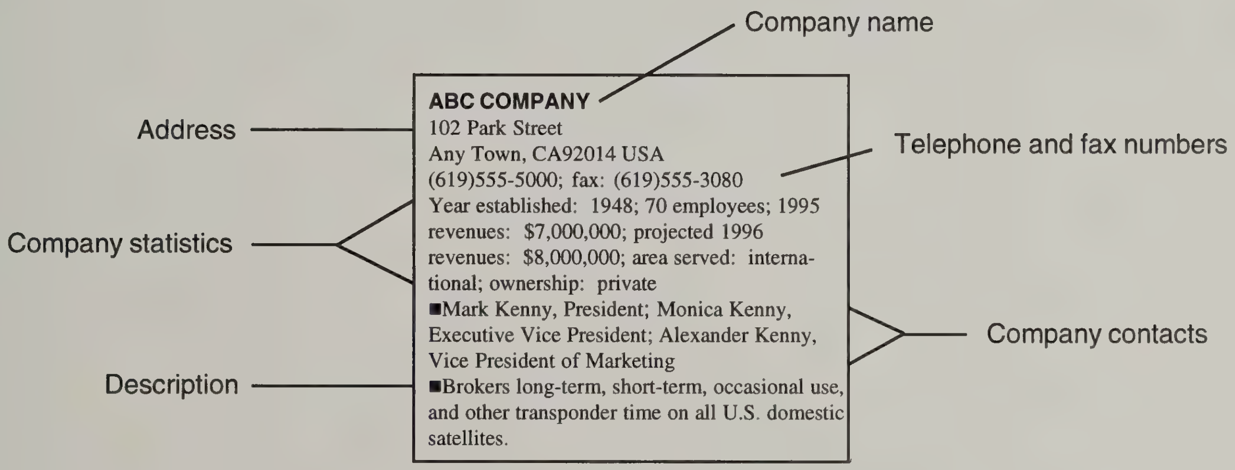
HOW TO USE THE ALMANAC

Each of the 9 sections of *Phillips 1997 World Satellite Almanac* begins with an introduction that explains what information is included, how that information is presented, and how to use that section. All sections are organized to give the reader useful, easy-to-find information for every aspect of the satellite industry.

The **Transponder Brokers and Resellers** section tells you whom to contact for capacity on all available satellites.



ABC COMPANY
102 Park Street
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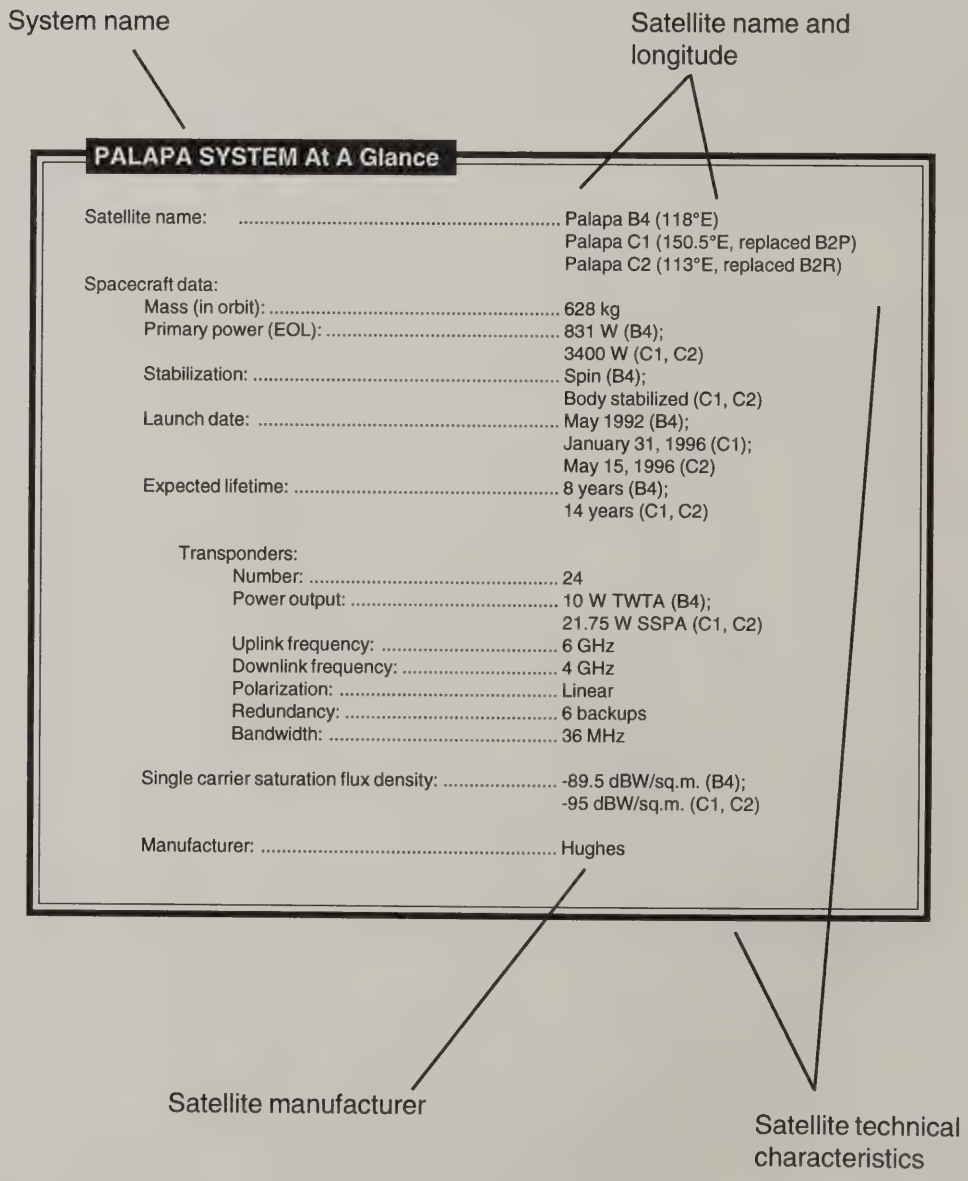
(619)555-5000; fax: (619)555-3080
Year established: 1948; 70 employees; 1995 revenues: $7,000,000; projected 1996 revenues: $8,000,000; area served: international; ownership: private
■Mark Kenny, President; Monica Kenny, Executive Vice President; Alexander Kenny, Vice President of Marketing
■Brokers long-term, short-term, occasional use, and other transponder time on all U.S. domestic satellites.

The **Satellite Operator** profiles provide easy access to information furnished by each operator. Each profile begins with information about the operator, including the operator's address, telephone and fax numbers, contact personnel, a company overview, a list of services offered, and satellite control networks. Following the operator information are *At A Glance* charts, which provide technical information on satellite systems operated by the company. Below is an example of a typical *At A Glance* chart. Profiles also contain transponder frequency plans and coverage maps of operational systems.


System name
Satellite name and longitude
Satellite manufacturer
Satellite technical characteristics

PALAPA SYSTEM At A Glance

Satellite name:	Palapa B4 (118°E) Palapa C1 (150.5°E, replaced B2P) Palapa C2 (113°E, replaced B2R)
Spacecraft data:	
Mass (in orbit):	628 kg
Primary power (EOL):	831 W (B4); 3400 W (C1, C2)
Stabilization:	Spin (B4); Body stabilized (C1, C2)
Launch date:	May 1992 (B4); January 31, 1996 (C1); May 15, 1996 (C2)
Expected lifetime:	8 years (B4); 14 years (C1, C2)
Transponders:	
Number:	24
Power output:	10 W TWTA (B4); 21.75 W SSPA (C1, C2)
Uplink frequency:	6 GHz
Downlink frequency:	4 GHz
Polarization:	Linear
Redundancy:	6 backups
Bandwidth:	36 MHz
Single carrier saturation flux density:	-89.5 dBW/sq.m. (B4); -95 dBW/sq.m. (C1, C2)
Manufacturer:	Hughes

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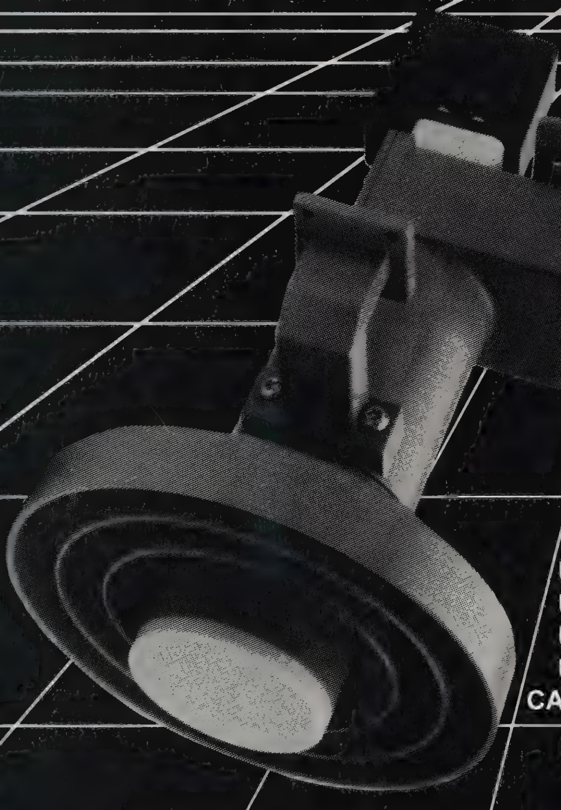

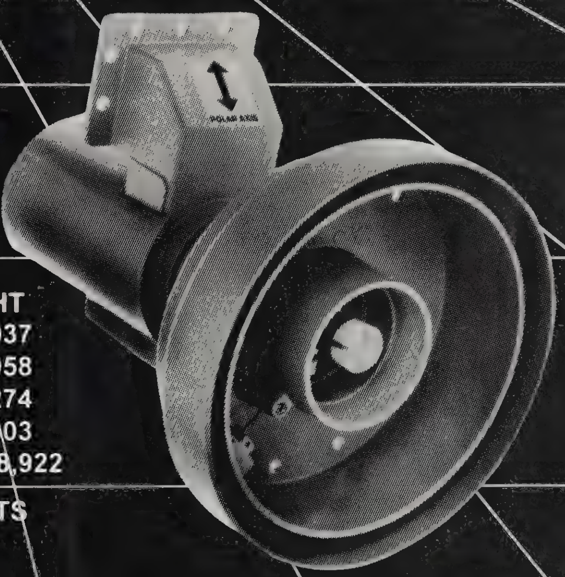

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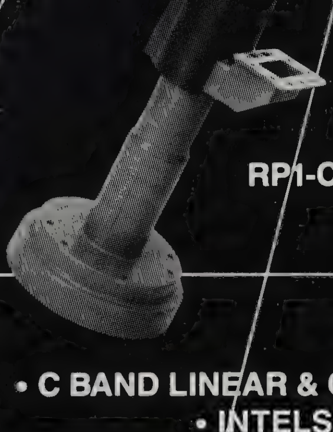

RP1-CP400

CP-300

CPOR-100

- C BAND LINEAR & CIRCULAR
- C/KU LINEAR & CIRCULAR
- KU 12 GHz FEEDS
- INTELSAT 4 GHz CIRCULAR
- ARABSAT S BAND FEEDS

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CALENDAR OF EVENTS '97

DATE	EVENT	LOCATION	PHONE	FAX
May 1-2	Space & Satellite Finance	New York, NY	(212)661-8740 (800)999-3123	(212)661-6677
May 19-23	AFCOM '97	Mbabane, Swaziland	(703)691-3570	(703)691-3572
May 26-28	New Space Markets	Strasbourg, France	+33 3-88-65-54-30	+33 3-88-65-54-47
May 27-29	Asean Cable & Satellite Television Forum 1997	Singapore	+852-2531-6125	+852-2586-1999
June 1-5	Supercomm '97	New Orleans, LA	(202)326-7361	(202)326-7333
June 2-3	Introduction to Satellite Technology Seminar	Washington, DC	(800)777-5006	(301)309-3847
June 8-12	IEEE International Conference on Communications-ICC '97	Montreal, PQ Canada	(514)765-7836	(514)761-8501
June 9-14	Asia Telecom	Singapore	+65-338-4747	+65-339-5651
June 10-12	International Conference & Exhibition for Satellite Communications, Control & Network Management	Washington, DC	(703)998-8332	(703)931-0275
June 12-17	Montreux 1997	Montreux, Switzerland	+41-21-963-3220	+41-21-963-8851

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EMAIL: starlink@telusplanet.net

Starlink Communications Inc. #2, 2616 - 16 Street NE,
Calgary, Alberta, Canada T2E 7J8

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DATE	EVENT	LOCATION	PHONE	FAX
June 16-18	TeleCon Europe	Helsinki, Finland	(510)606-5150	(510)606-9410
June 17-19	International Mobile Satellite Conference	Pasadena, CA	(818)354-4857	(818)354-6825
June 17-19	Satellite and Cable Latin America 97	Santiago, Chile	+56-2-246-8102	+56-2-246-8109
June 17-19	Taipei Satellite & Cable 97	Taipei, Taiwan	+886-2778-5818	+886-2778-2442
July 7-10	International Airborne Remote Sensing Conference & Exhibition	Copenhagen, Denmark	(313)994-1200, ext. 3453	(313)994-5123
September TBD	SCEC	Washington, DC	(800)828-0420	(404)618-0441
October 6-10	48th IAF Congress: Developing Business from from Space	Turin, Italy	+39 2-668121	+39 2-66812763
October 26-29	USTA's Centennial Convention	Chicago, IL	(202)326-7361	(202)326-7333
November 17-19	International Conference & Workshops on Applied Geologic Remote Sensing	Denver, CO	(313)994-1200, ext. 3453	(313)994-5123
December 2-6	Vietnam Telecomp 97	Hanoi, S.R. Vietnam	+852-2811-8897	+852-2516-5024

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INTERNATIONAL CALLING GUIDE

This guide is designed to assist you in making direct calls outside the United States. If direct dialing to a foreign country is not available to you, call your operator. Otherwise, an international call can be made by dialing: 1) 011, 2) the country code, 3) the city code, and 4) the local telephone number.

Most telephone numbers in the *Directory* contain the country code, city code and local number, so it will not be necessary to attach the appropriate country code to complete a call. For example, a French company may have +33 40-70636 listed as their telephone number. The chart below confirms that the country code for France is 33.

The following chart contains country names, city names and city codes (indented) as well as country codes (CC). Time differences (TD) are included to help you schedule your calls. The time differences are based on Eastern Standard Time with (A) denoting "ahead" and (B) denoting "behind."

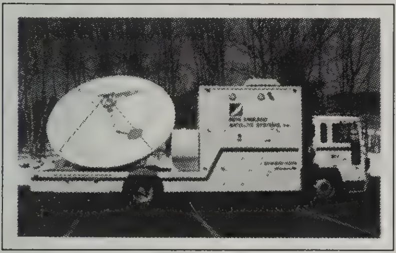
Country City & City Code	CC	TD
A		
Argentina	54	2A
Buenos Aires 1		
Australia	61	15A
Melbourne 3		
Syndey 2		
Austria	43	6A
Vienna 1 or 222		
B		
Belgium	32	6A
Antwerp 3		
Brussels 2		
Belize	501	1B
Bolivia	591	1A
Brazil	55	2A
C		
Chile	56	1A
China	86	13A
Beijing 1		
Colombia	57	0
Costa Rica	506	1B
Czech Republic	42	6A
D		
Denmark	45	6A
E		
Ecuador	593	0
Egypt	20	7A
El Salvador	503	1B
F		
Fiji	679	17A
Finland	358	7A
France	33	6A
Paris 1		
French Guiana	594	2A
G		
Germany	49	6A
Berlin 2		
Frankfurt 30		
Munich 89		
Greece	30	7A
Guatemala	502	1B
Guyana	592	2A
H		
Haiti	509	0
Hong Kong	852	13A
Hungary	36	6A
I		
Iceland	354	5A
India	91	10.5A
Indonesia	62	12A
Iran	98	8.5A
Iraq	964	8A
Ireland	353	5A
Israel	972	7A
Haifa 4		
Tel Aviv 3		
Italy	39	6A
Naples 81		
Rome 6		
J		
Japan	81	14A
Tokyo 3		
Yokohama 45		
K		
Kenya	254	8A
Korea	82	14A
Kuwait	965	8A
L		
Libya	218	7A
Liechtenstein	41	6A
Luxembourg	352	6A
M		
Mexico	52	1B
Monaco	339	6A
All points 93		
N		
The Netherlands	31	6A
Amsterdam 20		
Netherlands Antilles	599	1A
New Zealand	64	17A
Nicaragua	505	1B
Nigeria	234	6A
Norway	47	6A
P		
Panama	507	0
Paraguay	595	2A
Peru	51	0
Philippines	63	13A
Poland	48	6A
Portugal	351	5A
R		
Romania	40	7A
Russia	7	8A
S		
Saudi Arabia	966	8A
Singapore	65	13A
South Africa	27	7A
Spain	34	6A
Madrid 1		
Sweden	46	6A
Stockholm 8		
Switzerland	41	6A
Zurich 1		
T		
Taiwan	886	13A
Thailand	66	12A
Tunisia	216	6A
Turkey	90	7A
U		
United Arab Emirates	971	9A
United Kingdom	44	5A
London 171 or 181		
Uruguay	598	2A
V		
Venezuela	58	1A
Y		
Yugoslavia	381	6A
Z		
Zaire	243	6A

UPLINKING

New England Satellite Systems, Inc. provides commercial satellite services throughout the Northeast.

Our uplink vehicles feature:

Full redundancy/broadcast quality electronics, dual video capability, dual MCL 300 Watt HPA's (phase combinable), dual LNR Exciters (3 agile audio subcarriers), IFB equipped (wireless or wired), 3 cell phones, video switcher, DPS frame Synchronizer, full array of Tektronix test equipment and Sony Betacam Player/Recorder with TBC.

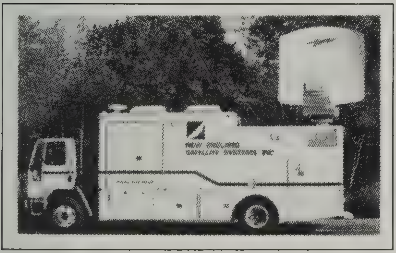


Uplink 1

- 3.7 m Andrew single piece reflector with dual port feed
- Licensed for international events
- Data-grade upconverters for compressed video/data applications
- Ultra-high powered earth station (80 DBW EIRP)
- AMSC Skycell® satellite telephone equipment

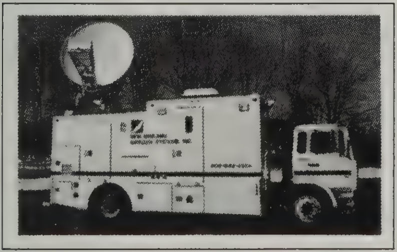
Uplink 2

- 2.4 m RSI reflector with four port feed
- GTE Skyswitch (3 line satellite phone system)
- Compact profile for urban areas (21' long)
- High powered earth station (75 DBW EIRP)



Uplink 3

- 2.4 m Andrew reflector with four port feed
- GTW Skyswitch (3 line satellite phone system)
- Data-grade upconverters for compressed video/data applications
- Betacam SP Editing capabilities in spacious interior
- GVG 110 switcher / Chyron Codi graphics generator / Mackie 16 Channel audio board High powered earth station (75 DBW EIRP)



Uplink 4

- 2.4 m Vertex reflector with four port feed
- AMSC Skycell® satellite telephone equipment
- Data-grade upconverters for compressed video/data applications
- Betacam SP Editing capabilities in spacious interior
- High powered earth station (75 DBW EIRP)

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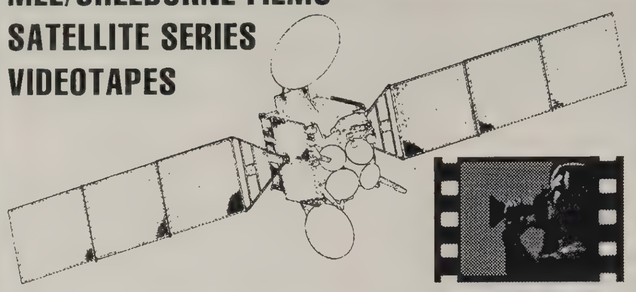

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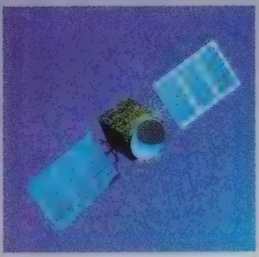

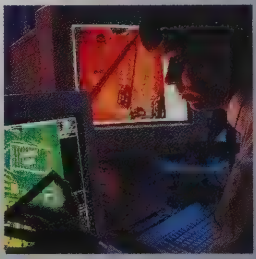

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CONTENTS

Foreword ix

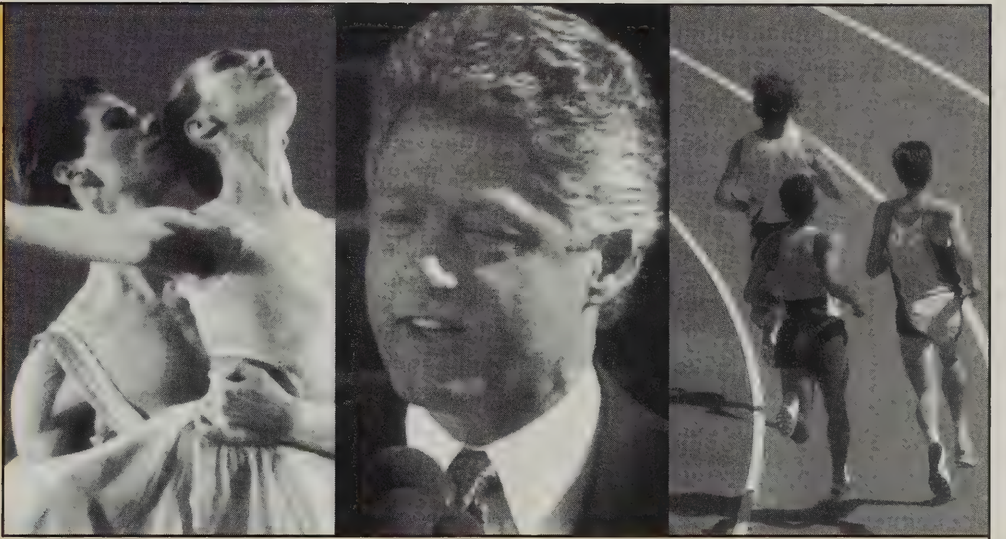
How to Use the Almanac xi

Calendar of Events '97 xiv

International Calling Guide xvi

Satellite Systems Index xxiii

Satellite Operator Index xxv



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Section 8: National Data, Regulation and Policy 541

Extensive information on geographical, demographical and technical information on countries, territories and islands including data on electrical and television broadcast standards, broadcast stations and broadcasters and the range of satellites visible.

Section 9: Reference Data 657

Includes satellite operators, transponder brokers, regulatory organizations, and satellite system names.

General Index 677

Advertisers Index 682

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SATELLITE SYSTEMS INDEX

ACeS 313
ACTS 287
AfriStar 343
Agila-II 321
AMOS 112
AMSC 197
Anik 37
APMT 350
Apstar 81
Arabsat 372
Archimedes 525
Arkos 172
Artemis 525
AsiaSat 381
AsiaStar 347
Astra 418
Aurora 192
Brazilsat 29
BS3 Yuri 133
CaribStar 345
CD Radio 334
Chinasat 52
Chinastar 305
Comstar 200
Constellation 352
DBS 204
DFH 52
DFS-Kopernikus 71
Directsat 337
DVS 339
EchoStar 206
Ekran 169
Ellipso 359
Eutelsat 399
Express 480
Galaxy 249
Gals 485
Garuda 313
GE 245
Gelikon 172
Globalstar 355
Glonass 295
Gorizont 163
GStar 227
Hispasat 174
Hot Bird 407
Indostar 317
Inmarsat 445
Insat 91
Intelsat 453
Intersputnik 489
Iridium 357
Italsat 116
JCSAT 119
Koreasat 136
Loralsat 341

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Circle 469 on reader service card

L-Star ... 523
M^{2}A ... 319
Measat ... 141
Molinya ... 293
Morelos ... 145
MSAT ... 49
Nahuel ... 3
Navstar ... 297
N-Star ... 125
Odyssey ... 361
Optus ... 9
Orbcomm ... 301
Orion ... 491
Palapa ... 104
PAS ... 502
Raduga ... 159
Rimsat ... 486
SABS ... 327
Satcom ... 212
SBS ... 262
SDRN/Loutch ... 171
Sesat ... 416
Sinosat ... 311
Sirius ... 182
Solidaridad ... 149
Spacenet ... 234
ST-1 ... 329
Starsys ... 299
Statsionar (see Gorizont and Raduga)
Superbird ... 127
TDF ... 68
TDRS ... 436
Tele-X ... 180
Telecom ... 59
Teledesic ... 363
Telstar ... 269
Tempo ... 289
Thaicom ... 185
Thor ... 154
Tongasat ... 526
Turksat ... 430
TV-SAT ... 77
Vitasat ... 365
W24 ... 415
Yamal ... 325

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SATELLITE OPERATOR INDEX

Air Force Space Command 296
Alascom Inc. 191
American Mobile Satellite Corporation (AMSC) 196
APT Satellite Company Ltd. 80
Arabsat (Arab Satellite Communications Organization) 370
Asia Broadcasting and Communications Network Plc. 522
Asia Cellular Satellite (ACeS) 312
Asia Pacific Mobile Telecommunications Satellite Pte. Ltd. (APMT) 350
Asia Satellite Telecommunications Company Ltd. (AsiaSat) 380
Binariang Sdn Bhd 140
CD Radio Inc. 333
China Orient Telecomm. Satellite Company Ltd. 304
Columbia Communications Corporation 434
Comsat Corporation 199
Constellation Communications Inc. 351
Deutsche Telekom AG 70
Directsat Corporation 336
DirecTV Inc. — A Unit of Hughes Electronics Corporation 203
Dominion Video Satellite Inc. 338
EchoStar Communications Corporation 205
Empresa Brasileira de Telecomunicacoes S.A. (Embratel) 28
European Space Agency (ESA) 524
Eutelsat (European Telecommunications Satellite Organization) 397
France Telecom 58
Friendly Islands Satellite Communications Ltd. (Tongasat) 526

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Circle 231 on reader service card

Gascom ... 324
GE American Communications (GE Americom) ... 211
GE Starsys ... 298
Globalstar Ltd. Partnership ... 353
Hispasat S.A. ... 173
Hughes Communications Inc. ... 248
Indian Department of Space ... 90
Inmarsat (International Mobile Satellite Organization) ... 440
Intelsat (International Telecommunications Satellite Organization) ... 447
Intersputnik (International Organization of Space Communications) ... 478
Iridium Inc. ... 356
Japan Satellite Systems Inc. (JSAT) ... 118
Loral Skynet Satellite Services ... 268
Loral Space & Communications Inc. ... 340
Mabuhay Philippines Satellite Corporation ... 320
Ministry for Postal Services and Telecommunications (Russia) ... 158, 292
Ministry of Communications (Korea) ... 135
Ministry of Defense (Russia) ... 294
Ministry of Posts and Telecommunications (China) ... 51
Ministry of Post, Telegraph and Telephone (Saudi Arabia) ... 326
Mobile Communications Holdings Inc. (Ellipso Corporation/Ellipsat International) ... 358
Nahuelsat S.A. ... 2
NASA Lewis Research Center ... 286
Nippon Telegraph and Telephone Corporation (NTT) ... 124
Nuova Telespazio S.p.A. ... 115
Odyssey Telecommunications International Inc. ... 360
Optus Communications Pty. Ltd. ... 8
Orbcomm Global L.P. ... 300
Orion Atlantic L.P. ... 490
P.T. Mediacitra Indostar ... 316
P.T. Satelit Palapa Indonesia ... 103
Panamsat ... 501
Pasifik Satelit Nusantara (PSN) ... 318
Shinawatra Satellite Public Company Ltd. ... 184
Singapore Telecommunications Ltd. ... 328
Sinosat Communications Company ... 310
Societe Europeenne des Satellites (SES) ... 417
Space Communications Corporation (SCC) ... 126
Spacecom — Satellite Communications Services Ltd. ... 111
Swedish Space Corporation ... 179
TAO ... 132
Telecomunicaciones de Mexico ... 144
Teledesic Corporation ... 362
Telefusion de France (TDF) ... 67
Telenor Satellite Services AS ... 153
Telesat Canada ... 36
Tempo Satellite Inc. ... 288
TMI Communications and Company Limited Partnership ... 48
Turk Telecom — Satcom Department ... 429
Volunteers in Technical Assistance ... 364
Worldspace Inc. ... 342

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Circle 475 on reader service card

GEOGRAPHIC INDEX

ARGENTINA
Nahuelsat S.A. 2

AUSTRALIA
Optus Communications Pty. Ltd. 8

BRAZIL
Empresa Brasileira de Telecomunicacoes S.A. (Embratel) 28

CANADA
Telesat Canada 36
TMI Communications and Company Limited Partnership 48

CHINA
China Orient Telecomm. Satellite Company Ltd. 304
Ministry of Posts and Telecommunications 51
Sinosat Communications Company 310

FRANCE
European Space Agency (ESA) 524
Eutelsat (European Telecomunications Satellite Organization) 397
France Telecom 58
Telefusion de France (TDF) 67

GERMANY
Deutsche Telekom AG 70

HONG KONG
APT Satellite Company Ltd. 80
Asia Satellite Telecommunications Company Ltd. (AsiaSat) 380

INDIA
Indian Department of Space 90

INDONESIA
Asia Cellular Satellite (ACeS) 312
P.T. Mediacitra Indostar 316
P.T. Satelit Palapa Indonesia 103
Pasifik Satelit Nusantara (PSN) 318

ISRAEL
Spacecom — Satellite Communication Services Ltd. 111

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Circle 475 on reader service card

ITALY
Nuova Telespazio S.p.A. 115

JAPAN
Japan Satellite Systems Inc. (JSAT) 118
Nippon Telegraph and Telephone Corporation (NTT) 124
Space Communications Corporation (SCC) 126
TAO 132

KOREA
Ministry of Communications 135

LUXEMBOURG
Societe Europeenne des Satellites (SES) 417

MALAYSIA
Binariang Sdn Bhd 140

MEXICO
Telecomunicaciones de Mexico 144

NORWAY
Telenor Satellite Services AS 153

PHILIPPINES
Mabuhay Philippines Satellite Corporation 320

RUSSIA
Gascom 324
Intersputnik (International Organization of Space Communications) 478
Ministry for Postal Services and Telecommunications 158, 292
Ministry of Defense 294

SAUDI ARABIA
Arabsat (Arab Satellite Communications Organization) 370
Ministry of Post, Telegraph and Telephone 326

SINGAPORE
Asia Pacific Mobile Telecommunications Satellite Pte. Ltd. (APMT) 350
Singapore Telecommunications Ltd. 328

SPAIN
Hispasat S.A. 173

SWEDEN
Swedish Space Corporation 179

THAILAND
Asia Broadcasting and Communications Network Plc. 522
Shinawatra Satellite Public Company Ltd. 184

TONGA
Friendly Islands Satellite Communications Ltd. (Tongasat) 526

TURKEY
Turk Telecom — Satcom Department 429

UNITED KINGDOM
Inmarsat (International Mobile Satellite Organization) 440

USA
Air Force Space Command 296
Alascom Inc. 191
American Mobile Satellite Corporation (AMSC) 196
CD Radio 333
Columbia Communications Corporation 434
Comsat Corporation 199
Constellation Communications Inc. 351
Directsat Corporation 336
DirecTV Inc. -- A Unit of Hughes Electronics Corporation 203
Dominion Video Satellite Inc. 338
EchoStar Communications Corporation 205
GE American Communications (GE Americom) 211
GE Starsys 298
Globalstar Ltd. Partnership 353
Hughes Communications Inc. 248
Intelsat (International Telecommunications Satellite Organization) 447
Iridium Inc. 356
Loral Skynet Satellite Services 268
Loral Space & Communications Inc. 340
Mobile Communications Holdings Inc.(Ellipsat Corporation/Ellipsat International) 358
NASA Lewis Research Center 286
Odyssey Telecommunications International Inc. 360
Orbcomm Global L.P. 300
Orion Atlantic, L.P. 490
Panamsat 501
Teledesic Corporation 362
Tempo Satellite Inc. 288
Volunteers in Technical Assistance 364
Worldspace Inc. 342

INDEX OF SERVICES OFFERED

DIGITAL AUDIO BROADCASTING (DAB) SYSTEMS

Country	Operator	Satellite(s)	Page
France	European Space Agency (ESA)	Artemis, Archimedes	524
Indonesia	P.T. Mediacitra Indostar	Indostar	316
Malaysia	Binariang Sdn Bhd	Measat	140
Thailand	Shinawatra Satellite Public Company Ltd.	Thaicom	184
USA	CD Radio Inc.	CD Radio	333
USA	Dominion Video Satellite Inc.	DVS	338
USA	Worldspace Inc.	AfriStar, CaribStar, AsiaStar	342

DIRECT BROADCAST SATELLITE (DBS) SERVICE

Country	Operator	Satellite(s)	Page
Australia	Optus Communications Pty. Ltd.	Optus	8
France	Eutelsat (European Telecommunications Satellites Organization)	Eutelsat	397
France	Telefusion de France	TDF	67
Germany	Deutsche Telekom AG	DFS-Kopernikus, TV-SAT	70
India	Indian Department of Space	Insat	90
Indonesia	P.T. Mediacitra Indostar	Indostar	316
Japan	TAO	BS3 Yuri	132
Korea	Ministry of Communications	Koreasat	135
Luxembourg	Societe Europeenne des Satellites (SES)	Astra	417
Norway	Telenor Satellite Services AS	Thor	153
Russia	Ministry for Postal Services and Telecommunications (Russia)	Ekran	158
Saudi Arabia	Ministry of Post, Telegraph and Telephone (Saudi Arabia)	SABS	326
Spain	Hispasat S.A.	Hispasat	173
Sweden	Swedish Space Corporation	Tele-X, Sirius	179
Thailand	Shinawatra Satellite Public Company Ltd.	Thaicom	184
USA	Directsat Corporation	Directsat	336
USA	DirecTV Inc. — A Unit of Hughes Electronics Corporation	DBS	203
USA	Dominion Video Satellite Inc.	DVS	338
USA	EchoStar Communications Corporation	EchoStar	205
USA	Tempo Satellite Inc.	Tempo	288

DOMESTIC FIXED SATELLITE SYSTEMS (FSS)

Country	Operator	Satellite(s)	Page
Argentina	Nahuelsat S.A.	Nahuel	2
Australia	Optus Communications Pty. Ltd.	Optus	8
Brazil	Empresa Brasileira de Telecomunicacoes S.A. (Embratel)	Brazilsat	28
Canada	Telesat Canada	Anik	36
China	Ministry of Posts and Telecommunications (China)	Chinasat (DFH-2A), DFH-3	51
France	France Telecom	Telecom	58
Germany	Deutsche Telekom AG	DFS-Kopernikus, TV-SAT	70
Hong Kong	APT Satellite Company Ltd.	Apstar	80
Hong Kong	Asia Satellite Telecommunications Company Ltd. (Asiasat)	Asiasat	380
India	Indian Department of Space	Insat	90
Indonesia	P.T. Satelit Palapa Indonesia	Palapa	103
Israel	Spacecom — Satellite Communications Services Ltd.	Amos	111
Italy	Nuova Telespazio S.p.A.	Italsat	115
Japan	Japan Satellite Systems Inc. (JSAT)	JCSAT	118
Japan	Nippon Telegraph and Telephone Corporation (NTT)	N-Star	128
Japan	Space Communications Corporation (SCC)	Superbird	126
Japan	TAO	BS3 Yuri	132
Korea	Ministry of Communications	Koreasat	135
Malaysia	Binariang Sdn Bhd	Measat	140
Mexico	Telecomunicaciones de Mexico	Morelos, Solidaridad	144
Norway	Telenor Satellite Services	Thor	153
Russia	Gascom	Yamal	324
Russia	Intersputnik	Express, Gorizont	478
Russia	Ministry for Postal Services and Telecommunications (Russia)	Raduga, Gorizont, Ekran, Loutch	158
Saudi Arabia	Arabsat	Arabsat	370
Singapore	Asia Pacific Mobile Telecommunications Satellite Pte. Ltd. (APMT)	APMT	350
Spain	Hispasat S.A.	Hispasat	173
Thailand	Asia Broadcasting and Communications Network Plc	L-Star	522
Thailand	Shinawatra Satellite Public Company Ltd.	Thaicom	184
Turkey	Turk Telecom — Satcom Department	Turksat	429
USA	Alascom	Aurora	191
USA	Columbia Communications Corporation	TDRS	434
USA	Comsat Corporation	SBS, Comstar	199
USA	GE American Communications (GE Americom)	Satcom, GStar, Spacenet	211

DOMESTIC FIXED SATELLITE SYSTEMS (FSS) continued

Country	Operator	Satellite(s)	Page
USA	Hughes Communications Inc.	Galaxy, SBS	248
USA	Intelsat	Intelsat	447
USA	Loral Skynet Satellite Services	Telstar	268
USA	Orion Atlantic, L.P.	Orion	490
USA	Panamsat	PAS	501

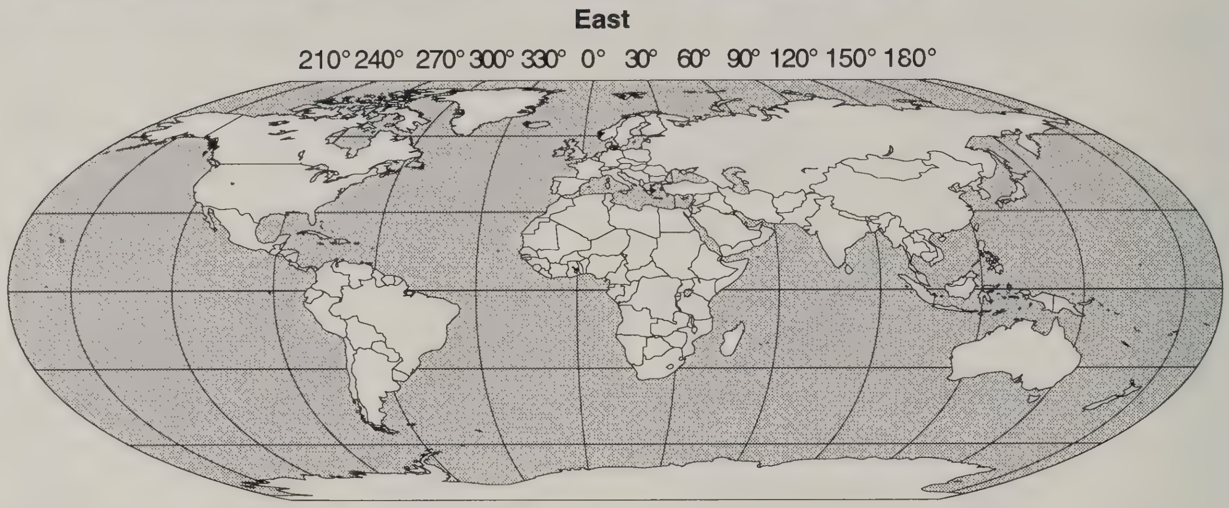
GLOBAL POSITIONING SYSTEMS (GPS)

Country	Operator	Satellite(s)	Page
Russia	Ministry of Defense (Russia)	Glonass	294
USA	Air Force Space Command	Navstar	296
USA	GE Starsys	Starsys	298

LOW EARTH ORBIT (LEO) SYSTEMS/MOBILE RADIO DETERMINATION SYSTEMS

Country	Operator	Satellite(s)	Page
Canada	TMI Communications and Company Limited Partnership	MSAT	48
Japan	Nippon Telegraph and Telephone Corporation (NTT)	N-Star	124
Russia	Ministry for Postal Services and Telecommunications (Russia)	Arkos	158
Saudi Arabia	Ministry of Post, Telegraph and Telephone (Saudi Arabia)	SABS	326
United Kingdom	Inmarsat (International Mobile Satellite Organization)	Inmarsat	440
USA	American Mobile Satellite Corporation	AMSC	196
USA	Constellation Communications Inc.	Constellation	351
USA	Globalstar Ltd. Partnership	Globalstar	353
USA	Iridium Inc.	Iridium	356
USA	Mobile Communications Holdings Inc. (Ellipsat Corporation/Ellipsat International)	Ellipso	358
USA	Orbcomm Global L.P.	Orbcomm	300
USA	Teledesic Corporation	Teledesic	362
USA	Odyssey Telecommunications International Inc.	Odyssey	360
USA	Volunteers in Technical Assistance	Vitasat	364

TABLE OF GEOSTATIONARY ORBITAL POSITIONS



Position	Satellite Name	Operator	Band(s)
3°	Italsat 2	Nuova Telespazio	Ka; Ku; S
3°	Telcom 1C and 2C	France Telecom	C; Ku; X
5°	Tele-X	Swedish Space	Ku
5.2°	Sirius	Swedish Space	Ku
7°	Eutelsat II-F4	Eutelsat	Ku
10°	Eutelsat II-F2	Eutelsat	Ku
12°	Raduga 22/ Statsionar 27	Russian PTT	C
13°	Eutelsat II-F1	Eutelsat	Ku
13°	Hot Bird 1and 2	Eutelsat	Ku
13.2°	Italsat 1	Nuova Telespazio	Ka; Ku; S
16°	Eutelsat II-F3	Eutelsat	Ku
19.2°	Astra 1A, 1B, 1C, 1D, 1E, 1F (b)	SES	Ku
21.5°	Eutelsat I-F5	Eutelsat	Ku
23.5°	DFS1-Kopernikus	Deutsche Telekom	Ku; Ka
25.5°	Eutelsat I-F4	Eutelsat	Ku
26°	Arabsat 2A	Arabsat	C; Ku
28.5°	DFS2-Kopernikus	Deutsche Telekom	Ku; Ka
31°	Arabsat 1C	Arabsat	C; C/S
31.3°	Turksat 1B	Turk Telecom	Ku
32°	Arabsat 2B	Arabsat	C; Ku
33°	Intelsat 510	Intelsat	C; Ku
35°	Raduga 28/ Statsionar 2	Russian PTT	C
36°	Gals 1 and 2	Intersputnik	Ku
40°	Gorizont 31/ Statsionar 12	Russian PTT	C; Ku; L
42°	Turksat 1C	Turk Telecom	Ku
45°	Raduga 23/ Statsionar 9	Russian PTT	C
48°	Eutelsat I-F1 (a)	Eutelsat	Ku
49°	Raduga 1-3/ Statsionar 24	Russian PTT	C
53°	Gorizont 27/ Statsionar 5	Russian PTT	C; Ku; L
57°	Intelsat 703	Intelsat	C; Ku
60°	Intelsat 604	Intelsat	C; Ku
63°	Intelsat 602	Intelsat	C; Ku
64°	Inmarsat-3 F1	Inmarsat	C; L
64.4°	Inmarsat-2 F1	Inmarsat	C; L
66°	Intelsat 704	Intelsat	C; Ku
68.5°	PAS-4	Panamsat	C; Ku
70°	Raduga 32/ Statsionar 20	Russian PTT	C
72°	Intelsat 501/505 (a)	Intelsat	C; Ku
74°	Insat-2A	Indian Dept. of Space	C; S
78.5°	Thaicom-1 and 2	Shinawatra	C; Ku
80°	Gorizont 24/ Statsionar 13	Russian PTT	C; Ku; L
80°	Express 6	Intersputnik	C; Ku
83°	Insat-1D and 2D	Indian Dept. of Space	C; S
85°	Arkos	Russian PTT	C; L
85°	Raduga 30/ Statsionar 3	Russian PTT	C
90°	Gorizont 28/ Statsionar 6	Russian PTT	C; Ku; L
91.5°	Measat 1	Binariang	C; Ku
93.5°	Insat-2B and 2C	Indian Dept. of Space	C; S
95°	SDRN/Loutch	Russian PTT	Ku; L
96°	Gorizont 19/ Statsionar 14	Russian PTT	C; Ku; L
99°	Ekran 20/ Statsionar T	Russian PTT	C
100.5°	AsiaSat 2	Asiasat	C; Ku
103°	Gorizont 25/ Statsionar 21	Russian PTT	C; Ku; L
105.5°	AsiaSat 1	Asiasat	C
110°	BS3 Yuri-A, B (b)	TAO	K
110.5°	Chinasat-1	Ministry of P&T	C
113°	Palapa C2	PT Satelit Palapa Indonesia	C
116°	Koreasat-1 and 2 (b)	Ministry of Comm	Ku
118°	Palapa B4	PT Satelit Palapa Indonesia	C
124°	JCSAT-4	Japan Satellite Sys	C; Ku
128°	JCSAT-3	Japan Satellite Sys	C; Ku

Position	Satellite Name	Operator	Band(s)
130°	Raduga 41/ Statsionar 41	Russian PTT	C; Ku; L
132°	N-Star A, B	Nippon	C; Ka; Ku; S
134°	Apstar-IA	APT	C
134°	Rimsat G1	Intersputnik	C; Ku
138°	Apstar-1	APT	C
140°	Gorizont 18/ Statsionar 7	Russian PTT	C; L; Ku
142.5°	Raduga 42/ Statsionar 42	Russian PTT	C; Ku; L
142.5°	Rimsat G2	Intersputnik	C; Ku
145°	Raduga 21/ Statsionar 16	Russian PTT	C; Ku; L
148°	Measat 2	Binariang	C; Ku
150°	JCSAT-1	Japan Satellite Sys	Ku
150.5°	Palapa C1	PT Satelit Palapa Indonesia	C; Ku
152°	Optus A3	Optus Comm	Ku
154°	JCSAT-2	Japan Satellite Sys	Ku
156°	Optus B3	Optus Comm	L; Ku
157°	Intelsat 503 (a)	Intelsat	C; Ku
158°	Superbird A	SCC	Ka; Ku
160°	Optus B1	Optus Comm	L; Ku
162°	Superbird B	SCC	Ka; Ku
169°	PAS-2	Panamsat	C; Ku
174°	Intelsat 701, 801	Intelsat	C; Ku
177°	Intelsat 702	Intelsat	C; Ku
178°	Inmarsat-2 F3	Inmarsat	C; L
178°	Inmarsat-3 F3	Inmarsat	C; L
180°	Intelsat 511	Intelsat	C; Ku
183°	Intelsat 513	Intelsat	C; Ku
186°	TDRS-5	CCC	C
190°	Arkos	Russian PTT	C; L
221°	Aurora II	Alascom	C
223°	Satcom C1	GE Americom	C
225°	Satcom C4	GE Americom	C
227°	Galaxy I.R	Hughes	C
229°	Satcom C3	GE Americom	C
235°	GStar II	GE Americom	Ku
235°	Galaxy V	Hughes	C
237°	Telstar 303 (a)	Loral Skynet	C
237°	SBS5	Hughes	Ku
237°	Galaxy IX	Hughes	C
241°	EchoStar-I and II	Echostar	Ku
241°	Tempo 1	Tempo	
243.2°	Morelos F2	Telecomunications de Mexico	C; Ku
247°	Solaridad II	Telecomunications de Mexico	C; L; Ku
248.9°	Anik E1	Telesat Canada	C; Ku
250.8°	Solaridad I	Telecomunications de Mexico	C; L; Ku
252.7°	Anik E2	Telesat Canada	C; Ku
253.5°	MSAT	TMI	L; Ku
255°	GStar IV	GE Americom	Ku
257°	GE-1	GE Americom	C; Ku
257°	GStar I	GE Americom	Ku
258.8°	DBS-1	DirecTV	Ku
259°	AMSC-1	AMSC	Ku; L
259°	Spacenet IV	GE Americom	C; Ku
259.1°	DBS-3	DirecTV	Ku
259.25°	DBS-2	DirecTV	Ku
260°	ACTS	NASA Lewis	Ka
261°	Galaxy IV	Hughes	C; Ku
265°	Galaxy III.R	Hughes	C
269°	Galaxy VII	Hughes	C; Ku
269°	Telstar 402R	Loral Skynet	C; Ku
273°	GStar III	GE Americom	Ku
273°	Spacenet III	GE Americom	C; Ku
275°	GE-2	GE Americom	C; Ku
275°	Telstar 302 (a)	Loral Skynet	C
275°	Satcom K1	GE Americom	Ku
279°	Satcom K2	GE Americom	Ku
283°	SBS4 (a)	Hughes	Ku
284°	Comstar D4 (a,b)	Comsat	C
284°	Nahuel C2 interim	Nahuelsat	Ku
286°	Galaxy VI	Hughes	C
286°	SBS6	Hughes	Ku
288°	Nahuel C1 interim	Nahuelsat	Ku
288°	Satcom 2R	GE Americom	C
288.2°	Nahuel C definitive	Nahuelsat	Ku
290°	Brazilsat B1	Embratel	C
291°	Satcom SN2	GE Americom	C; Ku
295°	Brazilsat A2 (a)	Embratel	C
295°	Brazilsat B2	Embratel	C
304.5	Intelsat 512	Intelsat	C; Ku
306°	Inmarsat-2 F4	Inmarsat	C; L
307°	Intelsat 706	Intelsat	C; Ku
310°	Intelsat 709	Intelsat	C; Ku
313°	TDRS-6	CCC	C
315°	PAS-1	Panamsat	C; Ku
317°	PAS-3	Panamsat	C; Ku
319°	TDRS-4	CCC	C
322.5°	Orion 1	Orion	Ku
325.5°	Intelsat 603	Intelsat	C; Ku
328.6°	Intelsat 506 (a)	Intelsat	C; Ku
330°	Hispasat 1A, 1B (b)	Hispasat SA	Ku; X
332.5°	Intelsat 601	Intelsat	C; Ku
335.5°	Intelsat 605	Intelsat	C; Ku
338.5°	Intelsat K	Intelsat	Ku
338.7°	Intelsat 515	Intelsat	C; Ku
341°	TDF 1, 2 (b)	Telefusion de France	Ku
342°	Intelsat 705	Intelsat	C; Ku
344°	SDRN/Loutch	Russian PTT	Ku; L
344.5°	Inmarsat-2 F2	Inmarsat	C; L
344.5°	Inmarsat-3 F2	Inmarsat	C; L
346°	Arkos	Russian PTT	C; L
346°	Express 2	Intersputnik	C; Ku
349°	Gorizont 26/ Statsionar 11	Russian PTT	C; L; Ku
352°	Telecom 2A	France Telecom	C; Ku; X
355°	Telecom 2B (b), 2D	France Telecom	C; Ku; X
356°	AMOS-1	Spacecom	Ku
359°	Intelsat 707	Intelsat	C; Ku
359.2°	Thor	Telenor Satellite Services	Ku
359.4°	TV-SAT 2	Deutsche Telekom	Ku

(a) inclined orbit; (b) collocated

'97 U.S. LAUNCH SCHEDULE

SATELLITE	LAUNCH COMPANY/ VEHICLE	LAUNCH DATE/ LAUNCH OR LANDING SITE
Globalstar	McDonnell Douglas/Delta II	July 1997/Cape Canaveral
Globalstar 2	McDonnell Douglas/Delta II	August 1997/Cape Canaveral
Iridium 1	McDonnell Douglas/Delta II	1997/Vandenberg
Iridium 2	McDonnell Douglas/Delta II	1997/Vandenberg
Iridium 3	McDonnell Douglas/Delta II	1997/Vandenberg
Iridium 4	McDonnell Douglas/Delta II	1997/Vandenberg
Iridium 5	McDonnell Douglas/Delta II	1997/Vandenberg
Iridium 6	McDonnell Douglas/Delta II	1997/Vandenberg
Iridium 7	McDonnell Douglas/Delta II	1997/Vandenberg
Iridium 8	McDonnell Douglas/Delta II	1997/Vandenberg
Norstar 1	E-Prime/Eagle II	1997/Ascension Island
Orbcomm I	Orbital Sciences Corporation/Pegasus XL	1997/Wallops Island
Orbcomm II	Orbital Sciences Corporation/Pegasus XL	1997/Wallops Island
Orbcomm III	Orbital Sciences Corporation/Pegasus XL	1997/Wallops Island
Orbcomm IV	Orbital Sciences Corporation/Pegasus XL	1997/Wallops Island
Tempo	Lockheed Martin/Atlas IIA	1997/Cape Canaveral

SECTION 1

OPERATIONAL GEOSTATIONARY SYSTEMS

Included in This Section:

This section contains existing and follow-on domestic commercial communications satellite systems in the geosynchronous orbit, and operational communications and navigation satellites. Operators included in this section are:

1. Nahuelsat S.A. 2
2. Optus Communications Pty. Ltd. 8
3. Empresa Brasileira de Telecomunicacoes S.A. (Embratel) 28
4. Telesat Canada 36
5. TMI Communications and Company Limited Partnership 48
6. Ministry of Posts and Telecommunications (China) 51
7. France Telecom 58
8. Telefusion de France (TDF) 67
9. Deutsche Telekom AG 70
10. APT Satellite Company Ltd. 80
11. Indian Department of Space 90
12. P.T. Satelit Palapa Indonesia 103
13. Spacecom — Satellite Communication Services Ltd. 111
14. Nuova Telespazio S.p.A. 115
15. Japan Satellite Systems Inc. (JSAT) 118
16. Nippon Telegraph and Telephone Corporation (NTT) 124
17. Space Communications Corporation (SCC) 126
18. TAO 132
19. Ministry of Communications (Korea) 135
20. Binariang Sdn Bhd 140
21. Telecomunicaciones de Mexico 144
22. Telenor Satellite Services AS 153
23. Ministry for Postal Services and Telecommunications (Russia) 158
24. Hispasat S.A. 173
25. Swedish Space Corporation 179
26. Shinawatra Satellite Public Company Ltd. 184
27. Alascom Inc. 191
28. American Mobile Satellite Corporation (AMSC) 196
29. Comsat Corporation 199
30. DirecTV — A Unit of Hughes Electronics Corporation 203
31. EchoStar Communications Corporation 205
32. GE American Communications (GE Americom) 211
33. Hughes Communications Inc. 248
34. Loral Skynet Satellite Services 268
35. NASA Lewis Research Center 286
36. Tempo Satellite Inc. 288

How to Use This Section:

Profiles are organized alphabetically by country, then by operator name.

NAHUELSAT S.A.

Lavalle 472, 3° Piso		Telephone:	+54 1-327-2292
(1047) Capital Federal		Facsimile:	+54 1-327-2319
ARGENTINA			

Booking Contacts:

Ing. Eckart Schober, Chief Executive Officer
Dr. Fidel Morales Moreno, Marketing and Sales Manager

Public Relations Contact:

Veronique Rodrigo Baehr, Responsible Corporate Image and Communication

Overview:

Operates a satellite telecommunications system called Nahuel. Provides satellite capacity in Argentina and Latin America.

Services Offered:

- Data transmission and reception
- Telecommunications: telephone, data, others
- TV, DTH, tele-education, tele-medicine, news gathering

Satellite Control Network:

Satellite control:	Benavidez - Provincia de Buenos Aires, Argentina
TT&C stations:	Benavidez - Provincia de Buenos Aires, Argentina

NAHUEL SYSTEM At A Glance

Satellite name:	Nahuel C1 interim, 288°E (72°W); Nahuel C2 interim, 284°E (76°W); Nahuel C definitive, 288.2°E (71.8°W)
Spacecraft data:	
Mass (in orbit):	1,116 kg (C1 interim), 1,107 kg (C2 interim), 1,089 kg (C definitive)
Primary power (EOL):	931 W (C1, C2 interim), 3,000 W (C definitive)
Stabilization:	Spin (C1, C2 interim), 3-axis (C definitive)
Launch date:	January 30, 1997 (C definitive)
Launch vehicle:	Ariane 44L (C definitive)
Expected lifetime:	12 years (C definitive)
Transponders:	
Number:	16 (C1, C2 interim), 18 Ku-band (C definitive)
Power output:	25 W TWT (C1, C2 interim), 55 W TWT (C definitive)
Polarization	Linear
Redundancy	26:18
Single carrier saturation flux density:	-85 dw/m^2 (C1, C2 interim), -94 dw/m^2 minimum on Argentina and Brazil (C definitive)
Manufacturer:	Hughes (C1, C2 interim), Aerospatiale (C definitive)

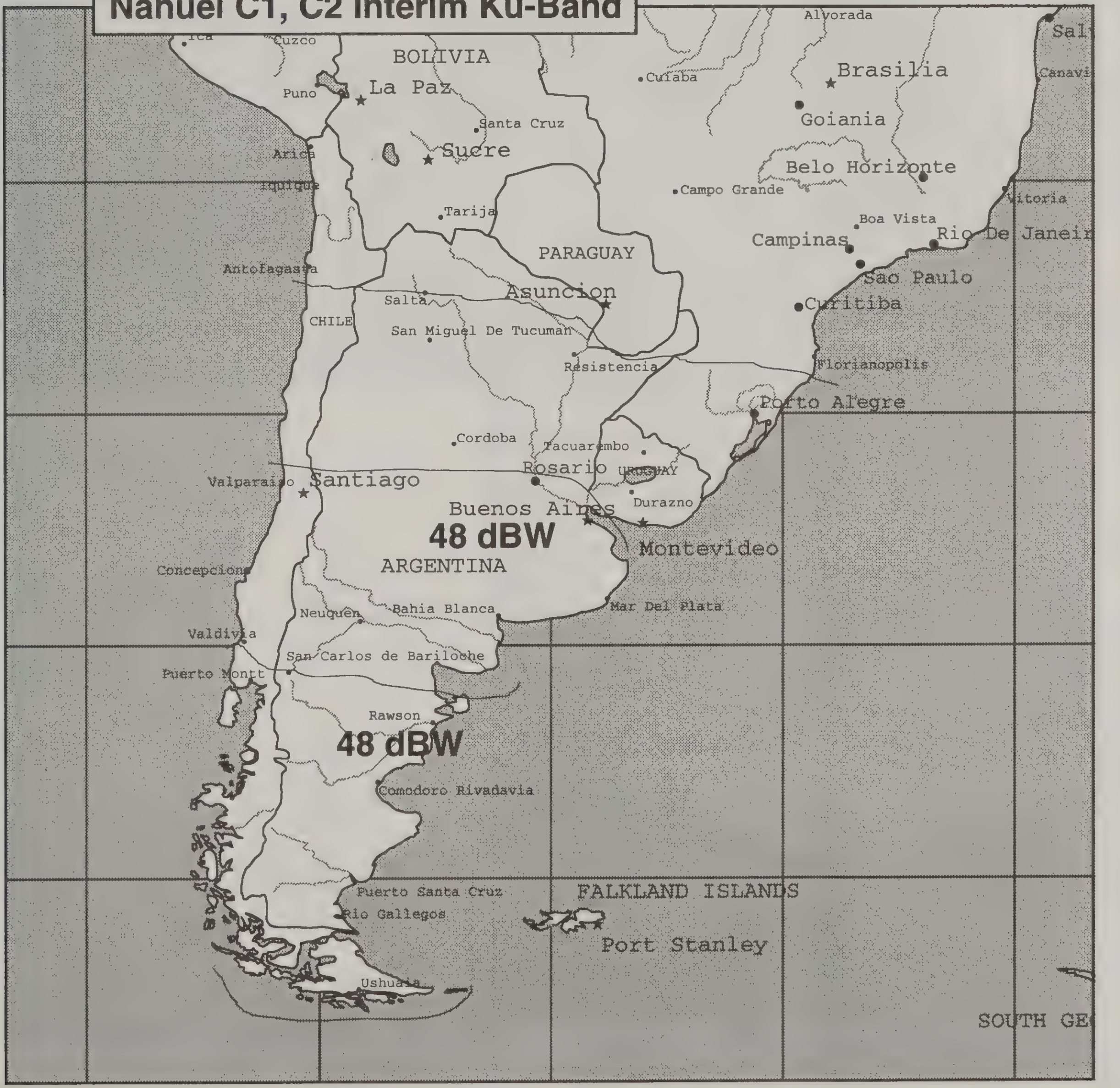
Nahuel C Transponder Frequency Plan

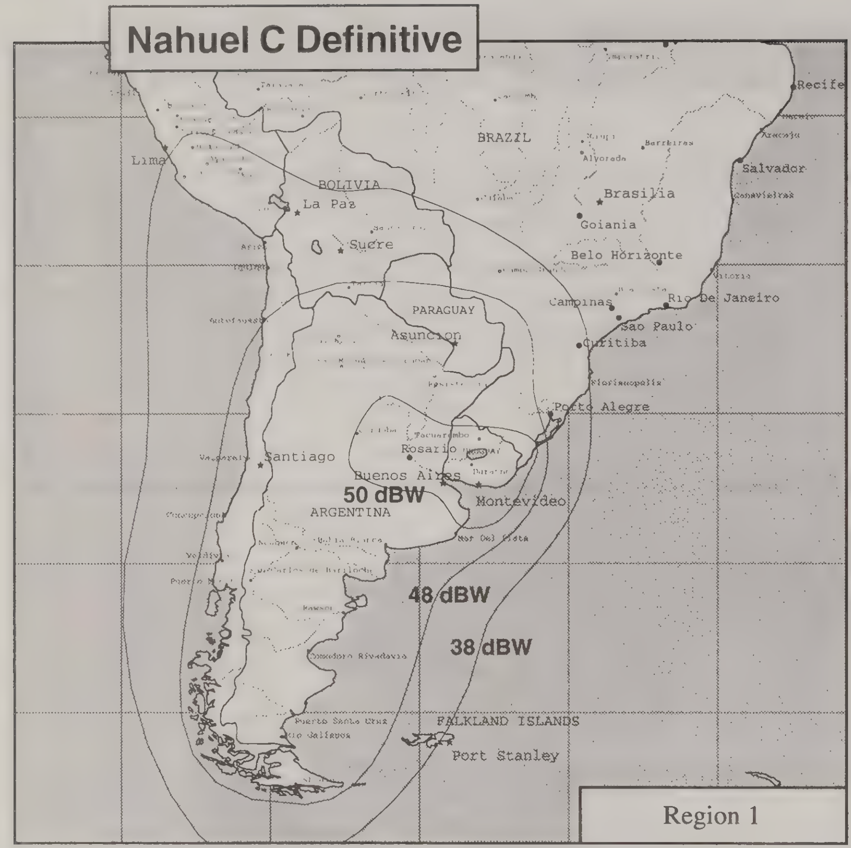
Tr.#	Pol.	Uplink(GHz)	Downlink(GHz)
1	V	14.030	11.730
2	H	14.043	11.743
3	V	14.091	11.791
4	H	14.104	11.804
5	V	14.152	11.852
6	H	14.165	11.865
7	V	14.213	11.913
8	H	14.226	11.926
9	V	14.274	11.974
10	H	14.287	11.987
11	V	14.335	12.035
12	H	14.348	12.048
13	V	14.396	12.096
14	H	14.409	12.109
15	V	14.457	12.157
16	H	14.470	12.170
17	V	13.7805	11.49167
19	V	13.8415	11.55267
21	V	13.9025	11.61367
23	V	13.9615	11.67267
TC	H	14.001	
TM	H		11.701
Beacom	H		11.700

Nahuel C1, C2 Interim and C Definitive

Orbital location:	288ºE (72°W) [C1]; 284°E (76°W) [C2]; 288.2°E (71.8) [C definitive]
Launch date:	January 30, 1997, Ariane 44L (C definitive)
Expected lifetime:	12 years (C definitive)
Expected end of life:	January 1997 (C1 and C2), 2009 (C definitive)

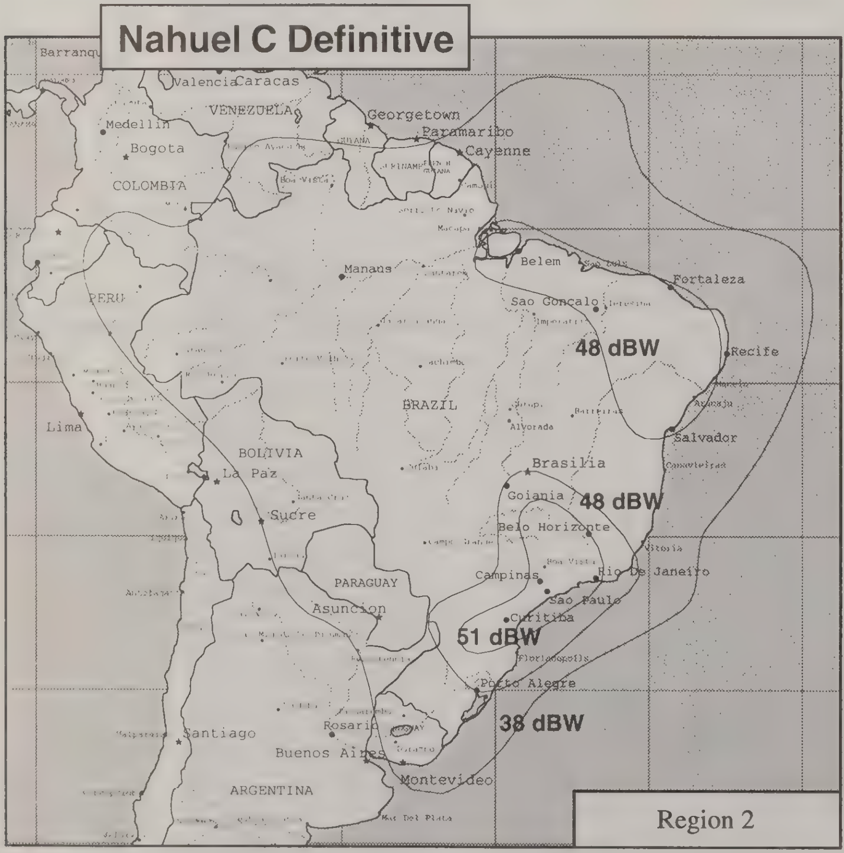
Nahuel C1, C2 Interim Ku-Band





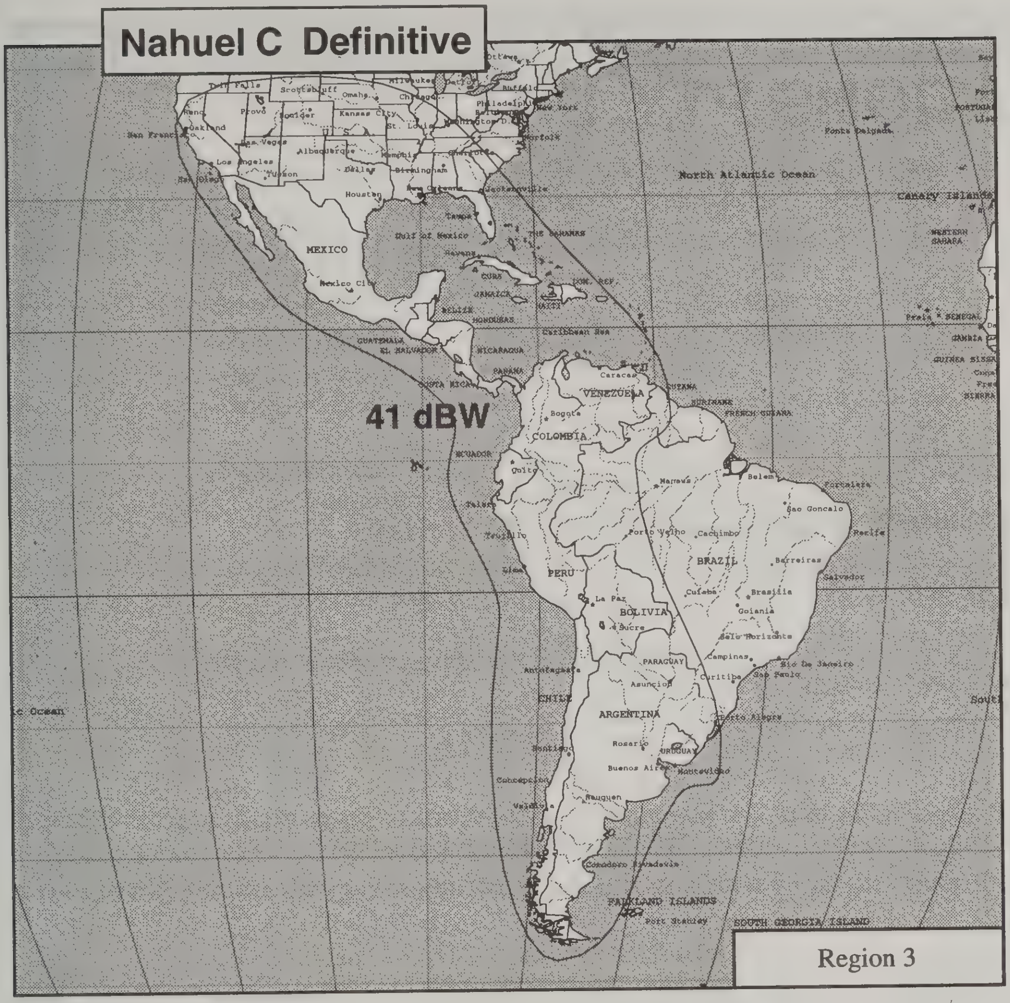
Nahuel C Definitive

Region 1



Nahuel C Definitive

Region 2


Nahuel C Definitive
41 dBW
Region 3
North Atlantic Ocean
Canary Islands
MEXICO
Gulf of Mexico
Caribbean Sea
VENEZUELA
COLOMBIA
ECUADOR
PERU
BRAZIL
BOLIVIA
PARAGUAY
CHILE
ARGENTINA
URUGUAY
FALKLAND ISLANDS
SOUTH GEORGIA ISLAND
San Francisco
Los Angeles
San Diego
Houston
Kansas City
Chicago
New York
Philadelphia
Washington
Mexico City
Caracas
Bogota
Quito
Lima
La Paz
Sucre
Asuncion
Santiago
Buenos Aires
Montevideo
Rosario
Porto Alegre
Sao Paulo
Rio De Janeiro
Brasilia
Salvador
Recife
Fortaleza
Belem
Manaus
Port Stanley

OPTUS COMMUNICATIONS PTY. LTD.

ACN 052833208
Optus Communications
101 Miller Street
North Sydney NSW 2000
AUSTRALIA

Telephone: +61 2-342-7800
Facsimile: +61 2-342-7100

Booking Contact:

Mark Harwood, Sales Manager, Media and Communications

Public Relations Contact:

David Foster, Public Affairs Manager

Overview:

Operates the Optus satellite system. Provides DBS (high quality TV relay) between major cities and data, voice, video, and telecommunications within Australia, its off-shore regions and the Southwest Pacific, including New Zealand.

Services Offered:

- Fixed and broadcast services: DBS, data transmission, DBS television, pay television, and radio, facsimile and telephone services
- Homestead and community broadcasting satellite service (HACBSS): uses the B-MAC television standard and can deliver one video program, six 15 kHz sound channels, a 9.6 Kbps data stream and auxiliary services such as telex. Can be received by small earth stations with 1.5-meter antennas

Satellite Control Network:

Satellite control:	Belrose, Sydney, NSW; Lockridge, Perth (backup)
TT&C stations:	Belrose, Sydney, NSW; Lockridge, Perth (backup)

OPTUS A SYSTEM At A Glance

Satellite name: .... Optus A3, 152°E
Spacecraft data:
- Mass (in orbit): .... 650 kg
- Primary power (EOL): .... 860 W
- Stabilization: .... Spin
- Launch date: .... September 16, 1987
- Launch vehicle: .... Ariane V19
- Expected lifetime: .... 10 years

- Transponders:
  - Number: 15
  - Power output: .... 6:4 30 W TWTAs
  - Polarization: .... Dual linear
  - Redundancy: .... 13:11 12 W TWTAs

- Single carrier saturation flux density: .... -80 to -90 dBW/sq.m.

- Manufacturer: .... Hughes Space and Communications

Optus A Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	45	35-41*	14.025	12.277
2	V	45	37-45	14.089	12.341
3	V	45	35-41*	14.153	12.405
4	V	45	35-41*	14.217	12.469
5	V	45	42-51	14.281	12.533
6	V	45	35-41*	14.345	12.597
7	V	45	39-45*	14.409	12.661
8	V	45	42-51	14.473	12.725
9	H	45	35-41*	14.057	12.309
10	H	45	35-41*	14.121	12.373
11	H	45	39-46	14.185	12.437
12	H	45	35-41*	14.249	12.501
13	H	45	35-41*	14.313	12.565
14	H	45	39-45*	14.377	12.629
15	H	45	39-45*	14.441	12.693

* National beam; Spot beam: 42-51 dBW
Spot beam EIRP dependent on transponder (channels 1-6 and 9-13 use 12 watt TWTAs; channels 7, 8, 14 and 15 use 30 watt TWTAs)

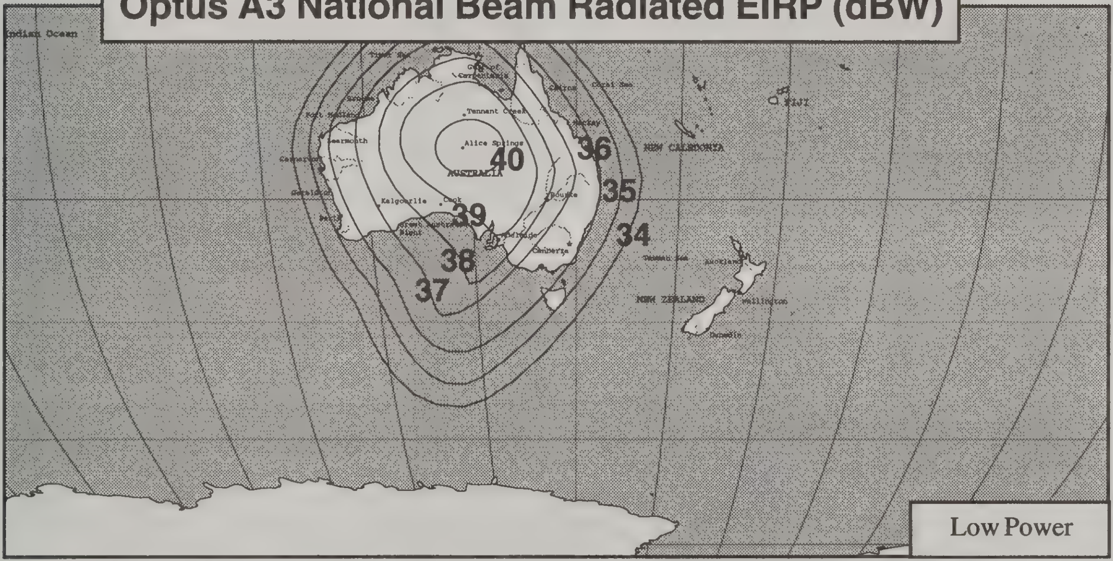
Optus A3

Orbital location:	152°E
Launch:	September 16, 1987, Ariane V19
Expected lifetime:	10 years
Expected end of life:	1997

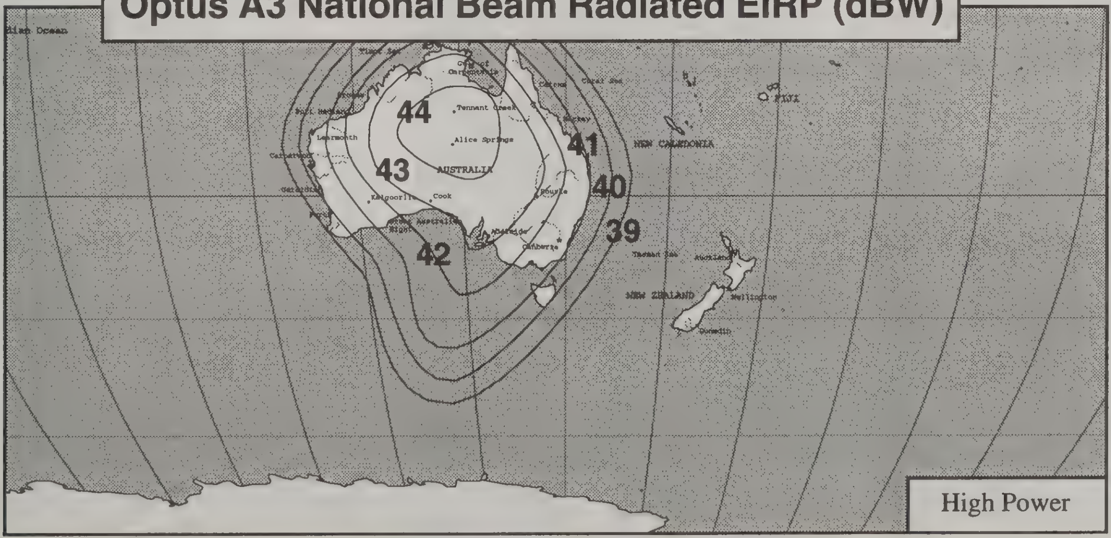
Antennas beam coverage overview:

Ku-band:	Australia, Papua New Guinea, Southwest Pacific

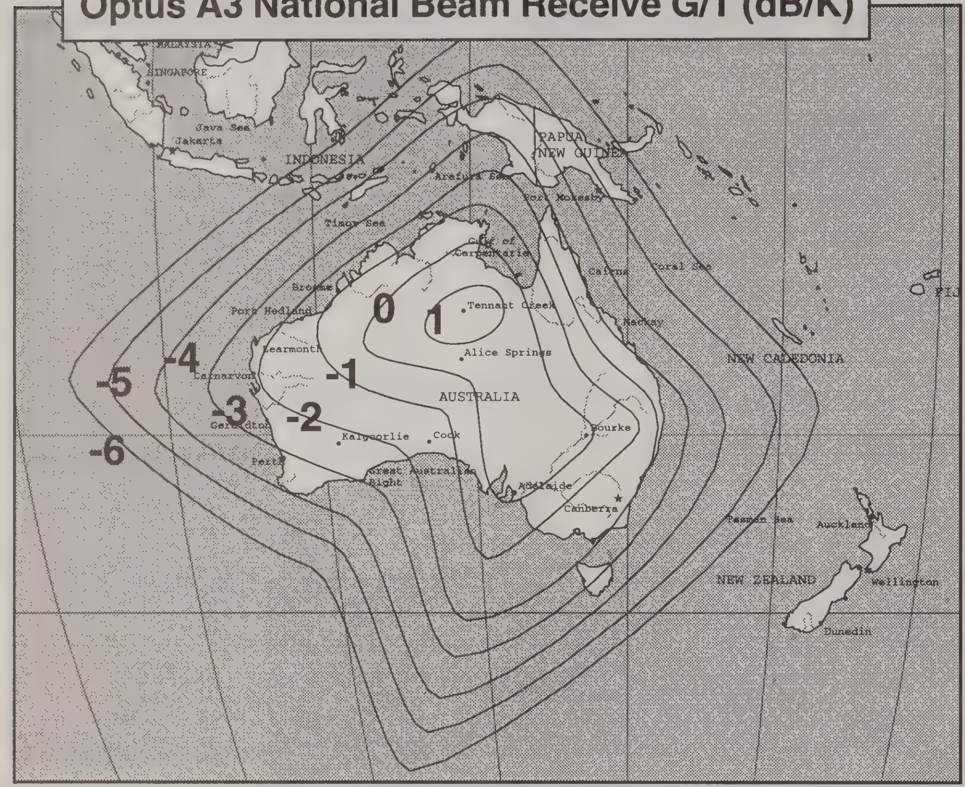
Optus A3 National Beam Radiated EIRP (dBW)



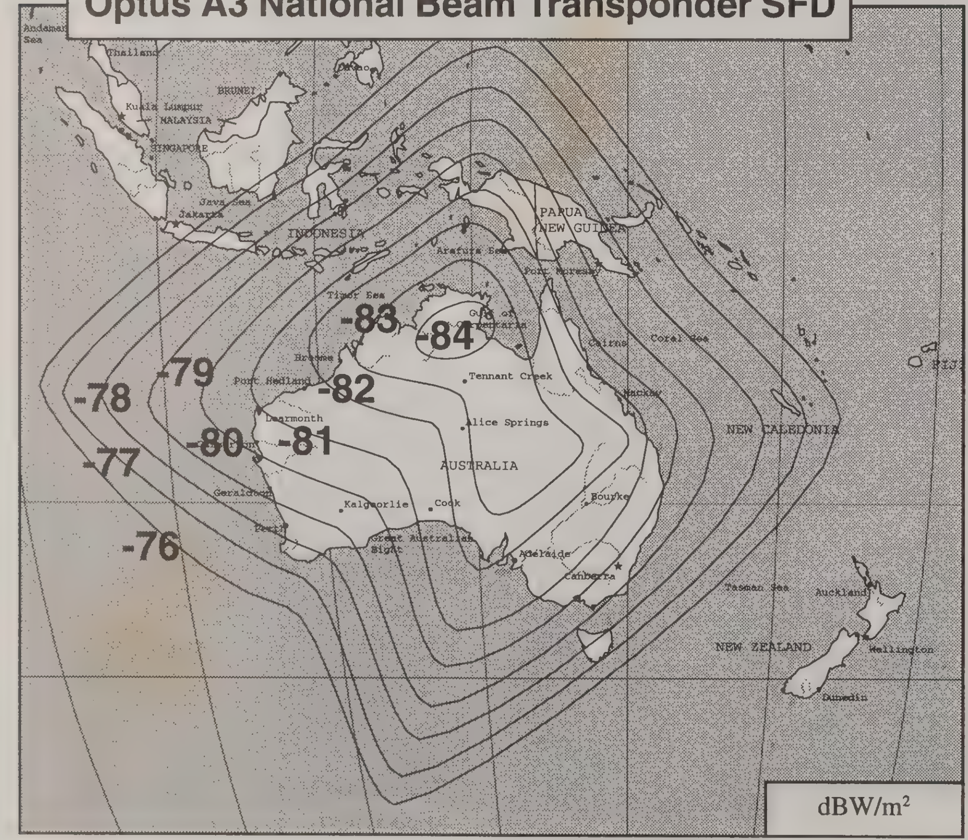
Optus A3 National Beam Radiated EIRP (dBW)

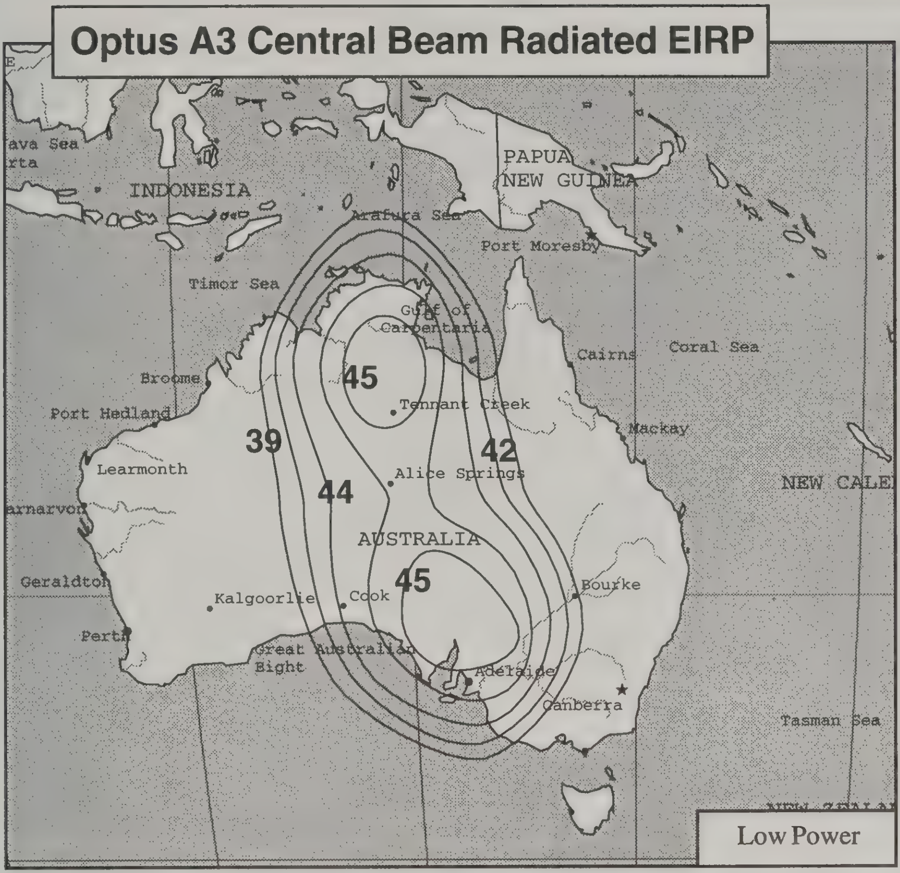


Optus A3 National Beam Receive G/T (dB/K)

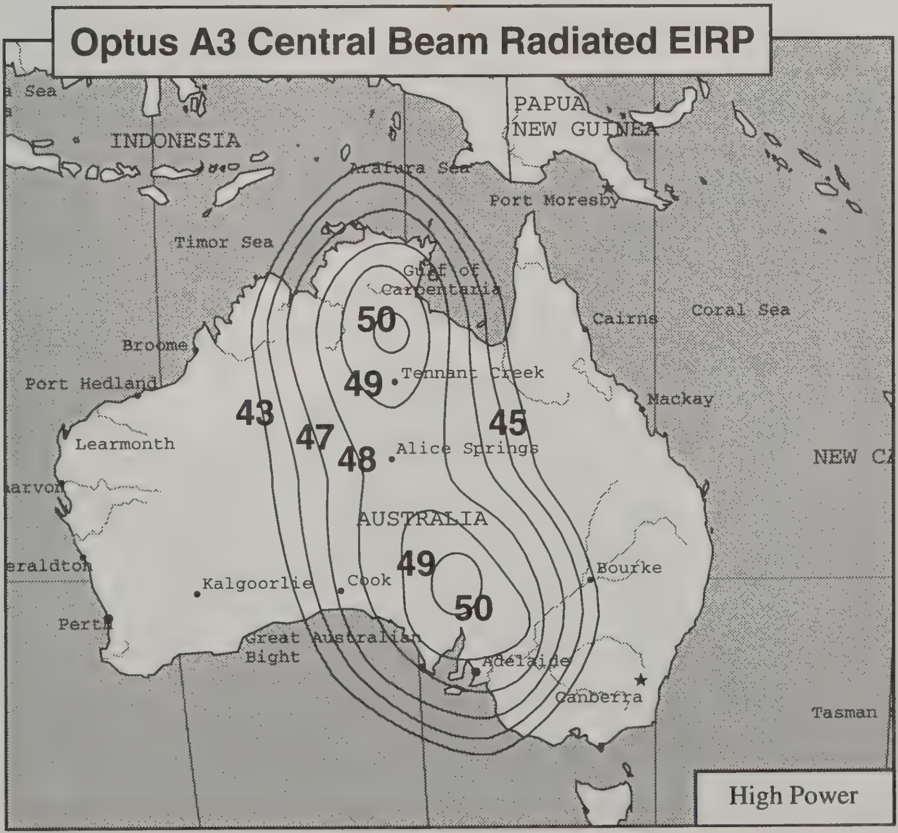


Optus A3 National Beam Transponder SFD



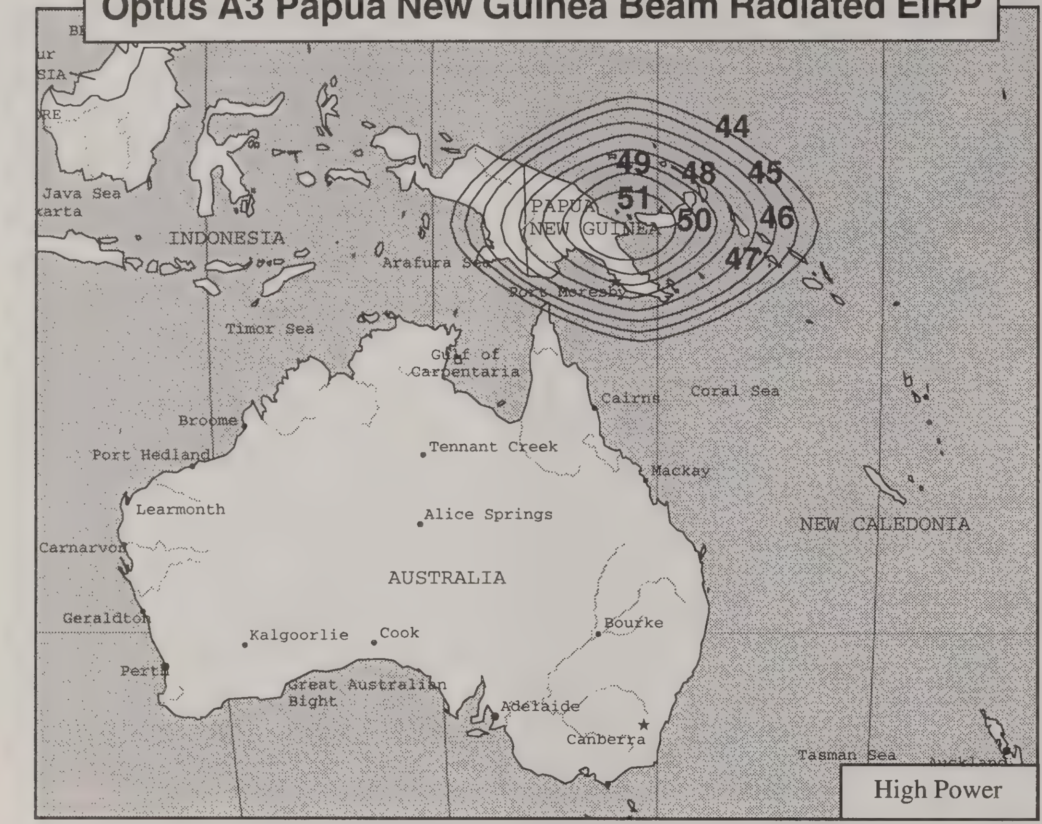


Optus A3 Central Beam Radiated EIRP

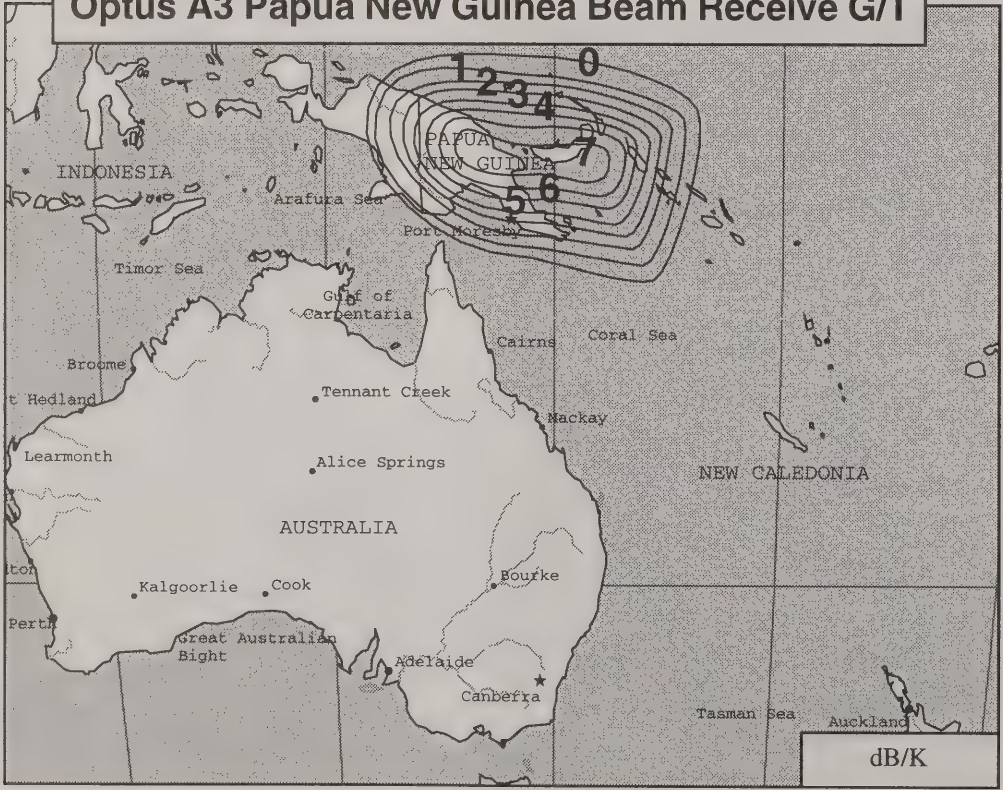


Optus A3 Central Beam Radiated EIRP

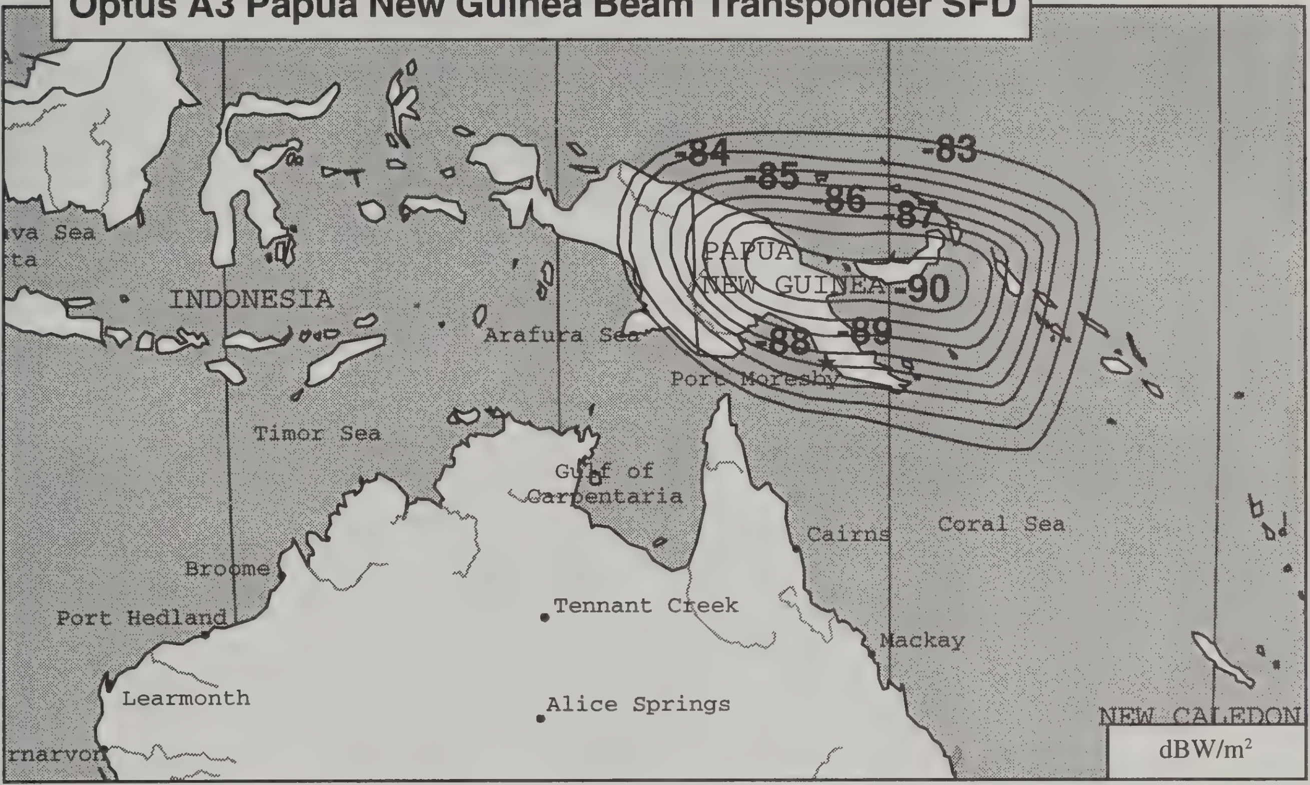
Optus A3 Papua New Guinea Beam Radiated EIRP



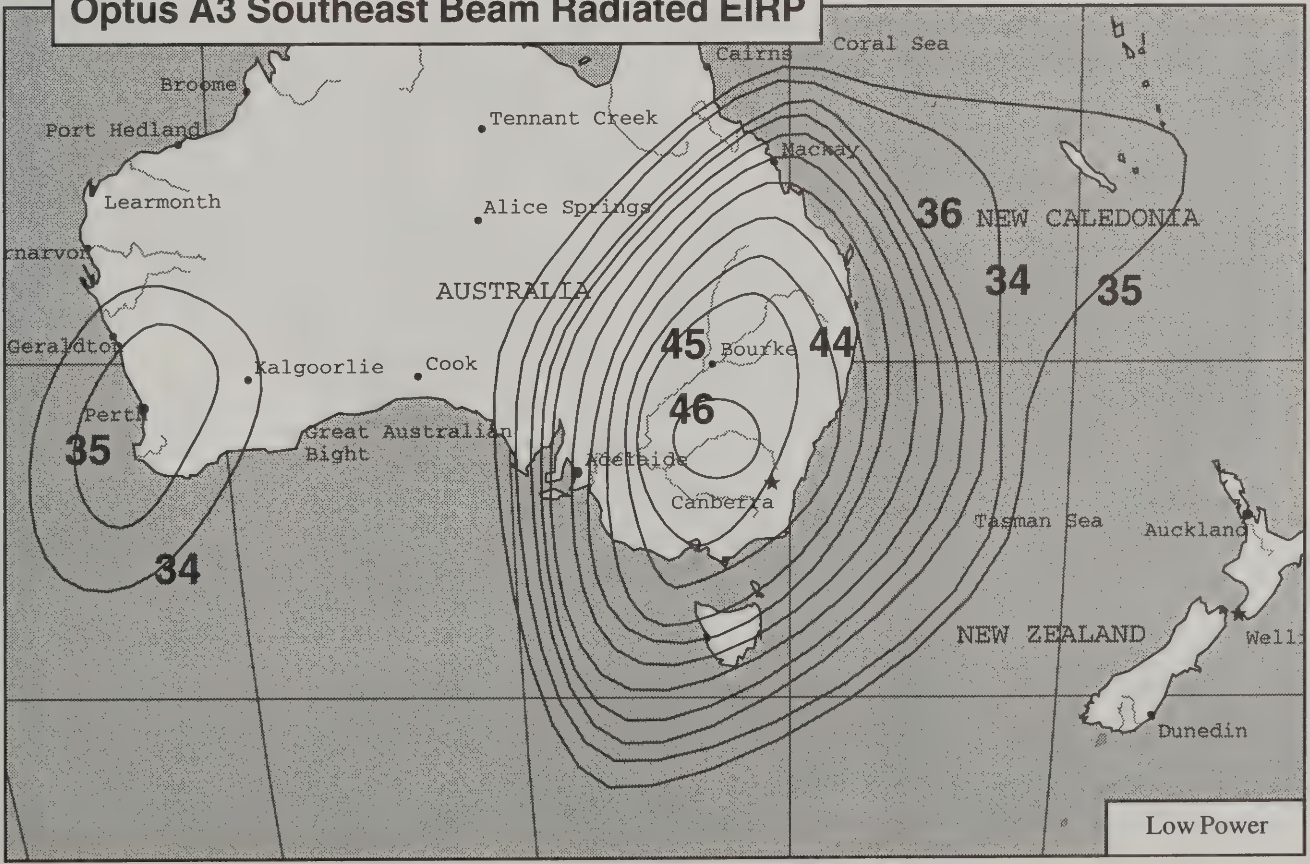
Optus A3 Papua New Guinea Beam Receive G/T

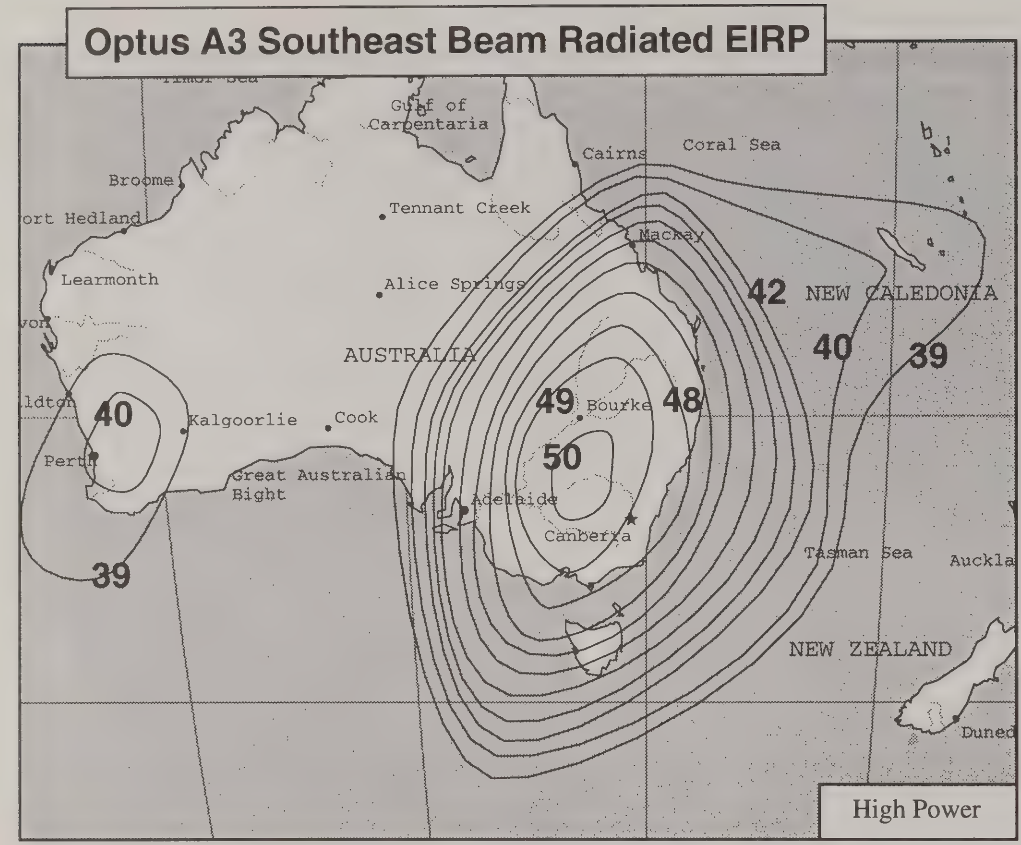


Optus A3 Papua New Guinea Beam Transponder SFD

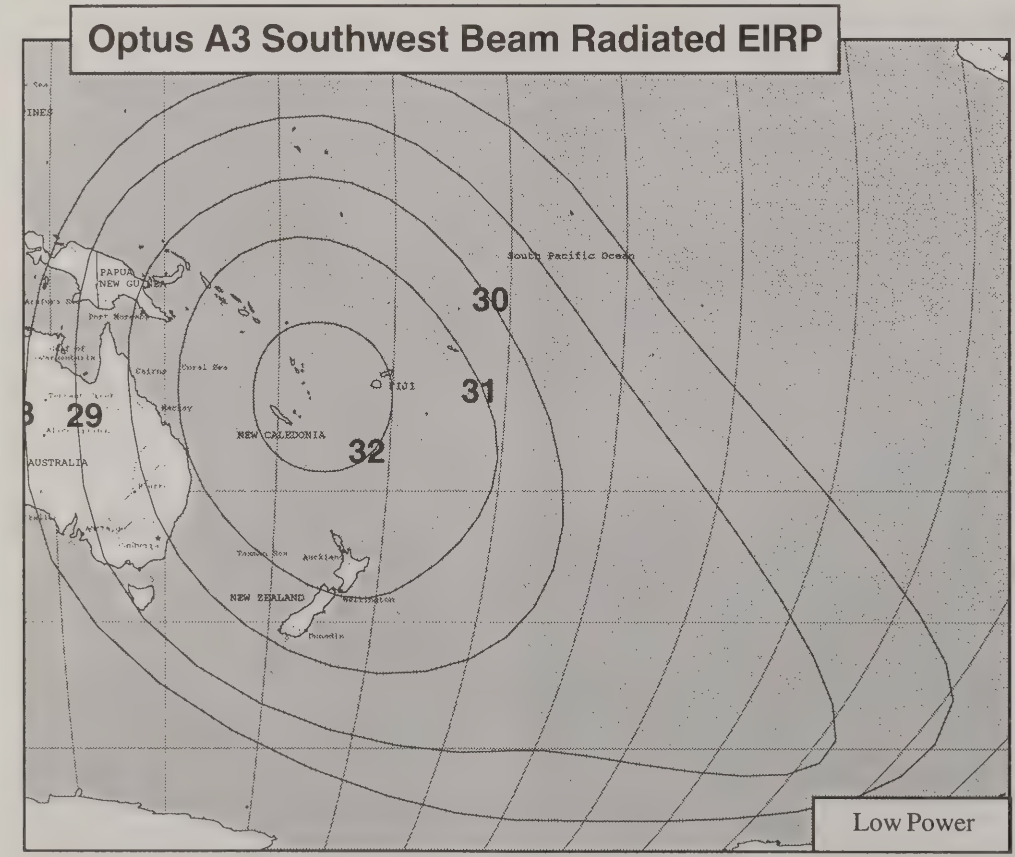


Optus A3 Southeast Beam Radiated EIRP



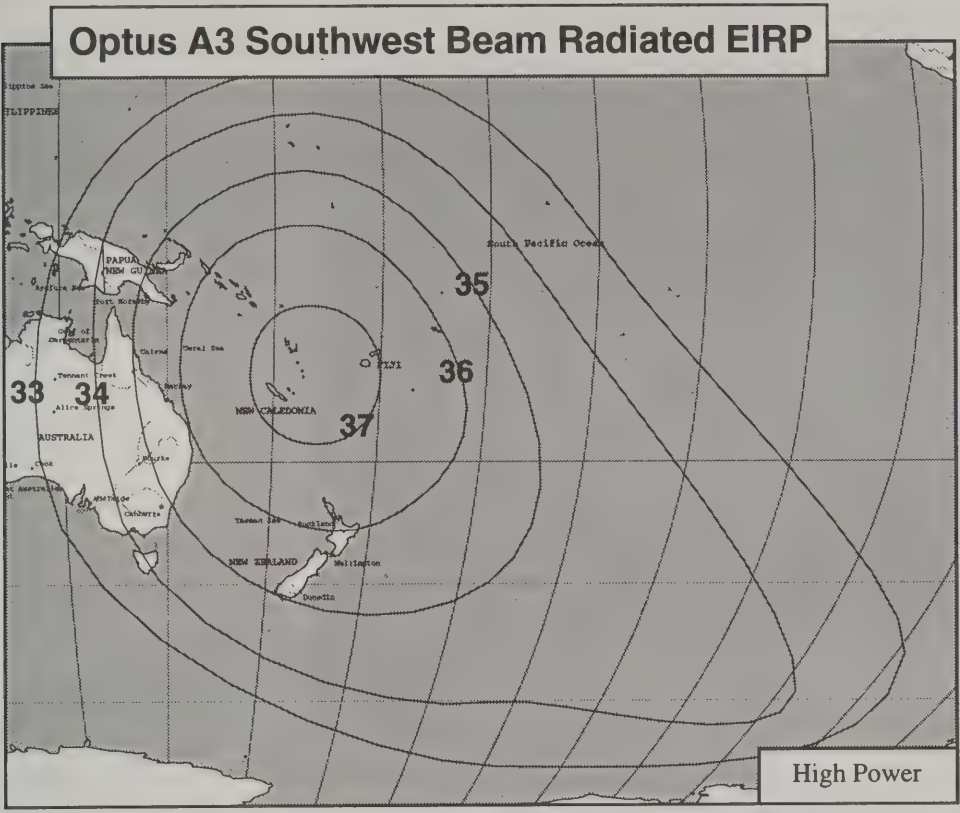


Optus A3 Southeast Beam Radiated EIRP

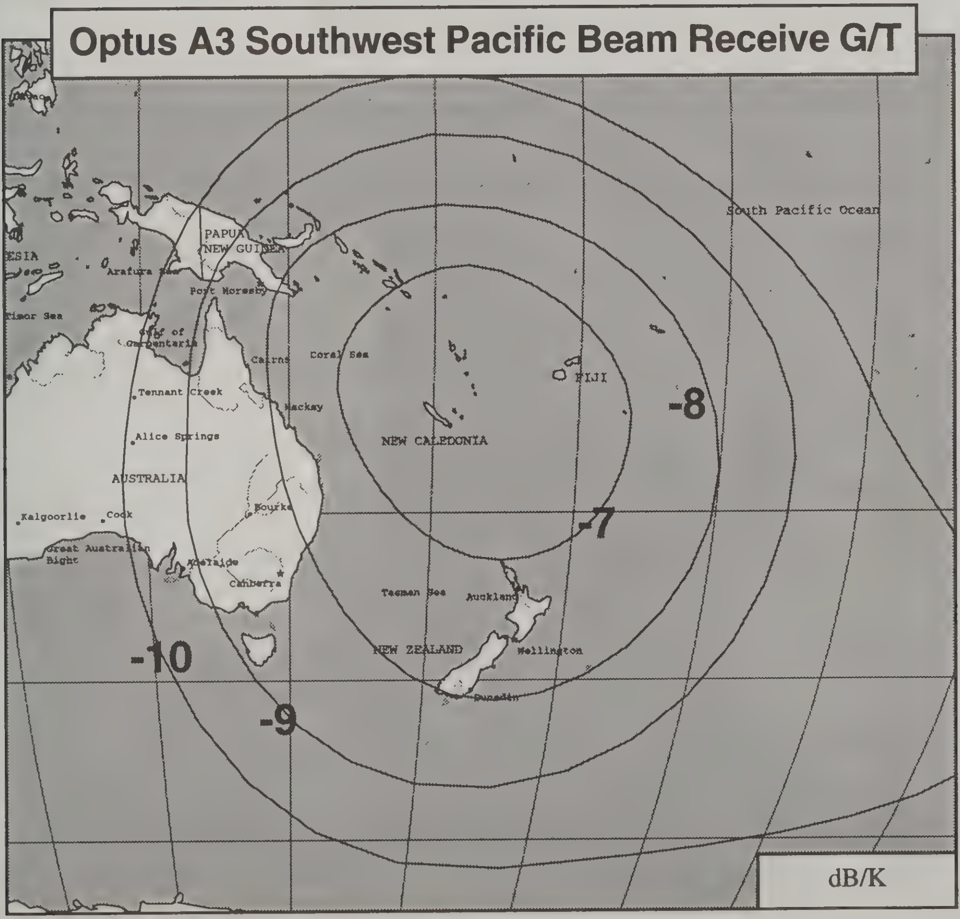


Optus A3 Southwest Beam Radiated EIRP

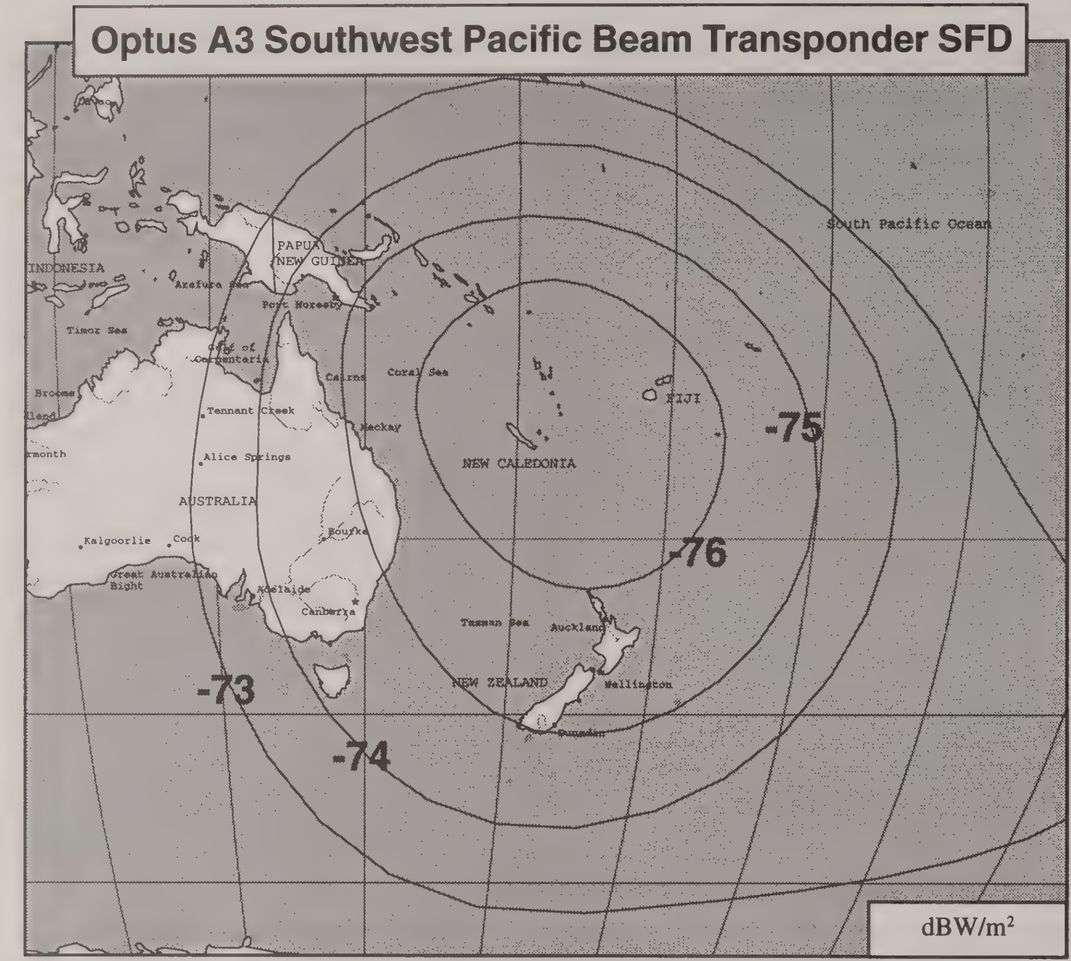
Optus A3 Southwest Beam Radiated EIRP



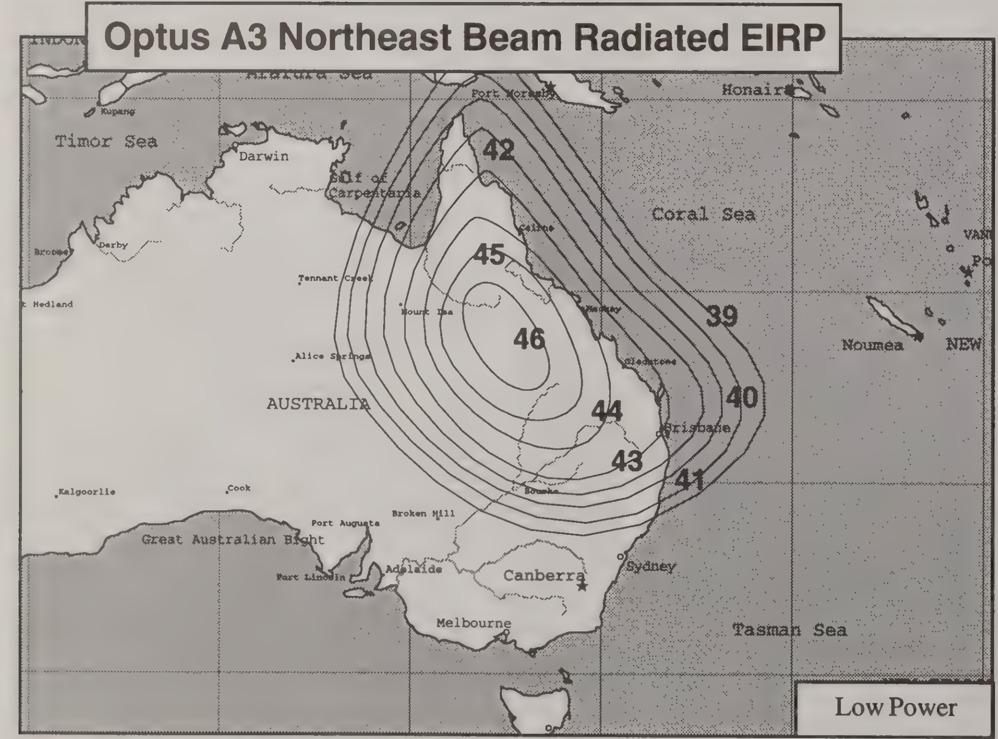
Optus A3 Southwest Pacific Beam Receive G/T



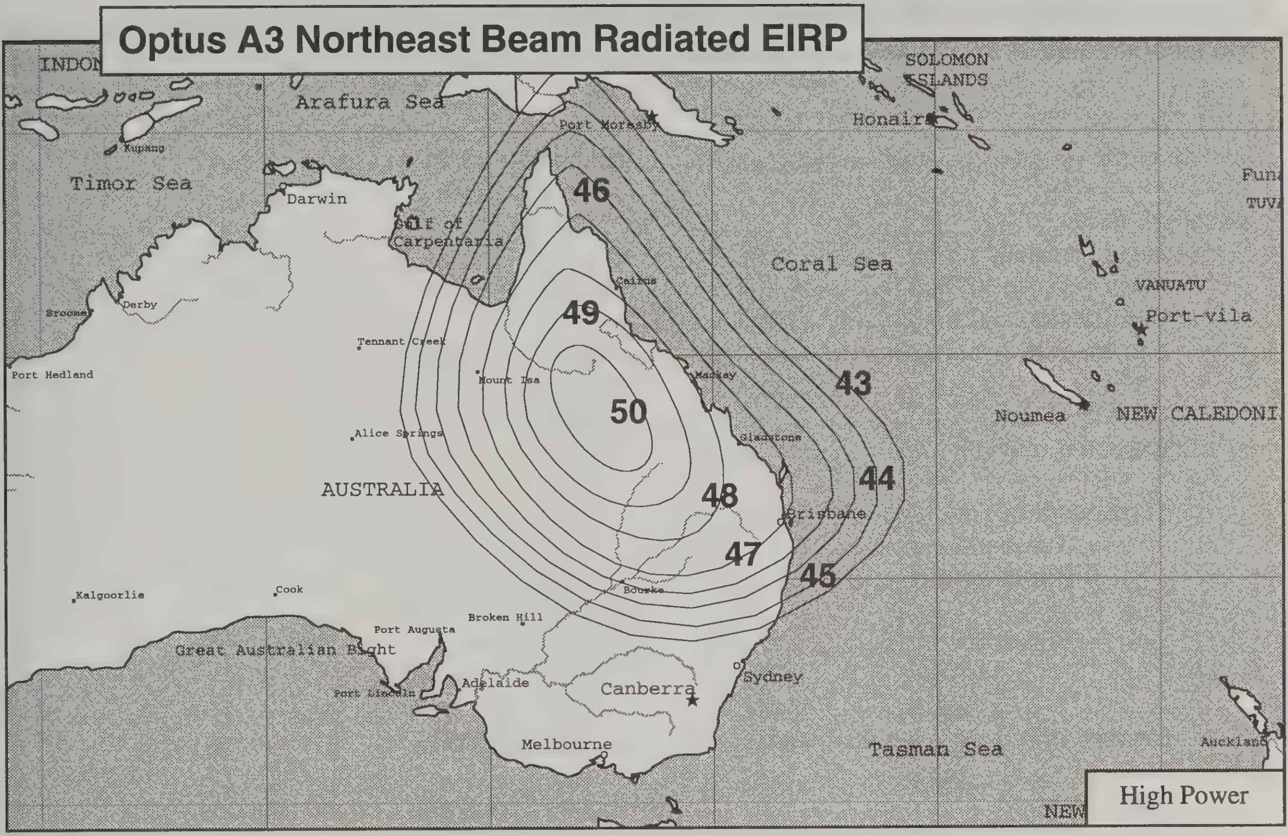
Optus A3 Southwest Pacific Beam Transponder SFD



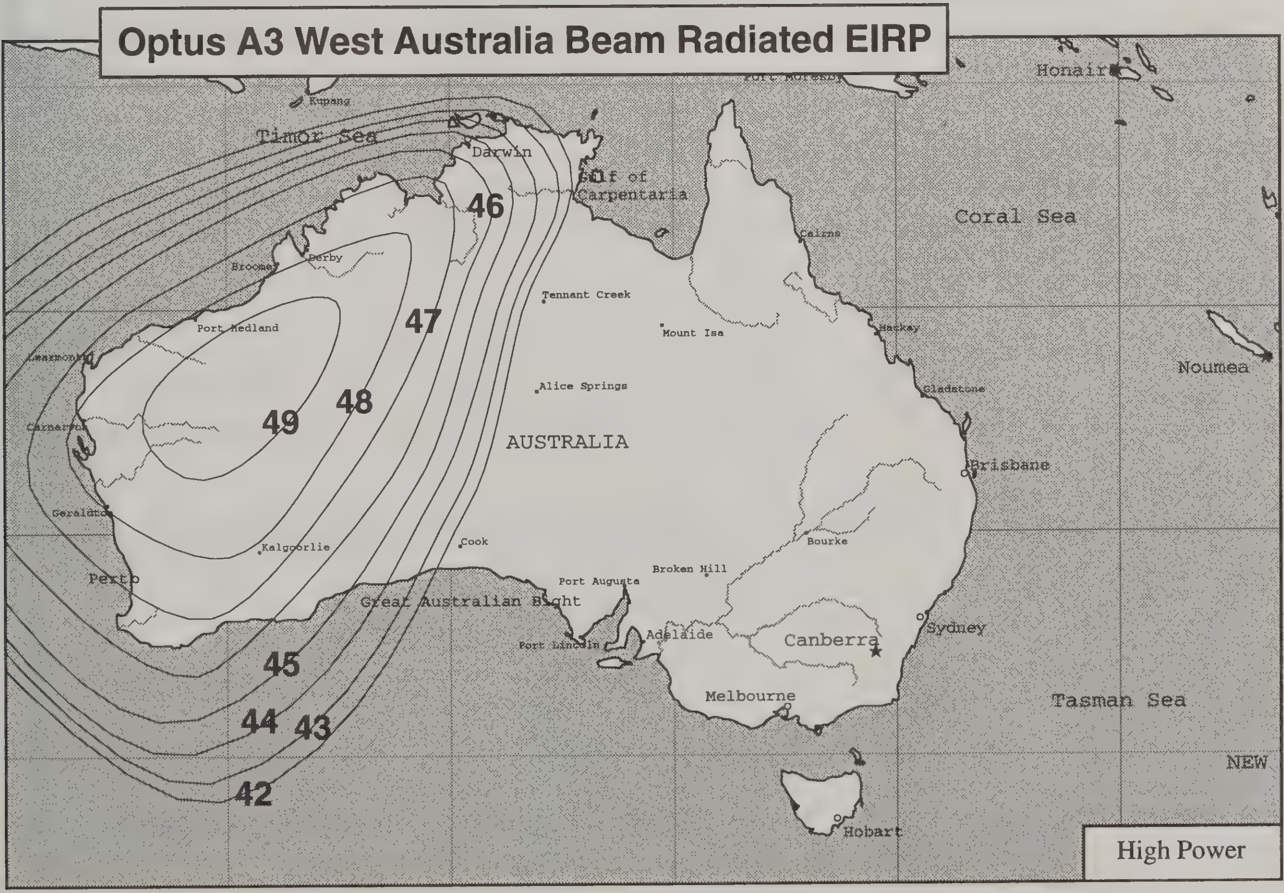
Optus A3 Northeast Beam Radiated EIRP



Optus A3 Northeast Beam Radiated EIRP



Optus A3 West Australia Beam Radiated EIRP



OPTUS B SYSTEM At A Glance

Satellite name:	Optus B1, 160°E; Optus B3, 156°E
Spacecraft data:	
Mass (in orbit):	1,650 kg
Primary power (EOL):	3,000 W
Stabilization:	3-axis
Launch date:	August 14, 1992 (B1), August 28, 1994 (B3)
Launch vehicle:	Long March 2E
Expected lifetime:	13 years
Transponders:	
Number:	15
Power output:	150 W SSPA (L-band), 50 W TWTA (Ku-band)
Polarization:	RHCP (L-band), Dual linear (Ku-band)
Single carrier saturation flux density:	-71 to -98 dBW/sq.m.
Manufacturer:	Hughes Space and Communications

Optus B Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	54	42-45*	14.0299	12.2819
2	V	54	42-45*	14.0925	12.3445
3	V	54	42-45*	14.1551	12.4071
4	V	54	42-45*	14.2177	12.4697
5	V	54	42-45*	14.2803	12.5323
6	V	54	42-45**	14.3429	12.5949
7	V	54	42-45* *	14.4055	12.6575
8	V	54	42-45* *	14.4681	12.7201
9	H	54	42-45*	14.0612	12.3132
10	H	54	42-45*	14.1238	12.3758
11	H	54	42-45*	14.1864	12.4384
12	H	54	42-45*	14.2490	12.5010
13	H	54	42-45*	14.3116	12.5636
14	H	54	42-45*	14.3742	12.6262
15	H	54	42-45*	14.4368	12.6888

* National beam (Lord Howe Island: 36 dBW); Australian regional spot beam: 42-49 dBW; New Zealand beam: 48-53 dBW (Chatham Island: 40 dBW; Campbell and Raoul Islands: 35 dBW)

** National beam (Lord Howe Island: 36 dBW; Christmas and Cocos Islands via Western Australia beam only); Australian regional spot beam: 42-49 dBW; New Zealand beam: 48-53 dBW (Chatham Island: 40 dBW; Campbell and Raoul Islands: 35 dBW)

Lord Howe Island EIRP = 42 dBW on south east spot beam
Norfolk Island EIRP = 42 dBW on south east spot beam
Christmas Island EIRP = 39 dBW on western Australia beam
Cocos Island EIRP = 38 dBW on western Australia beam

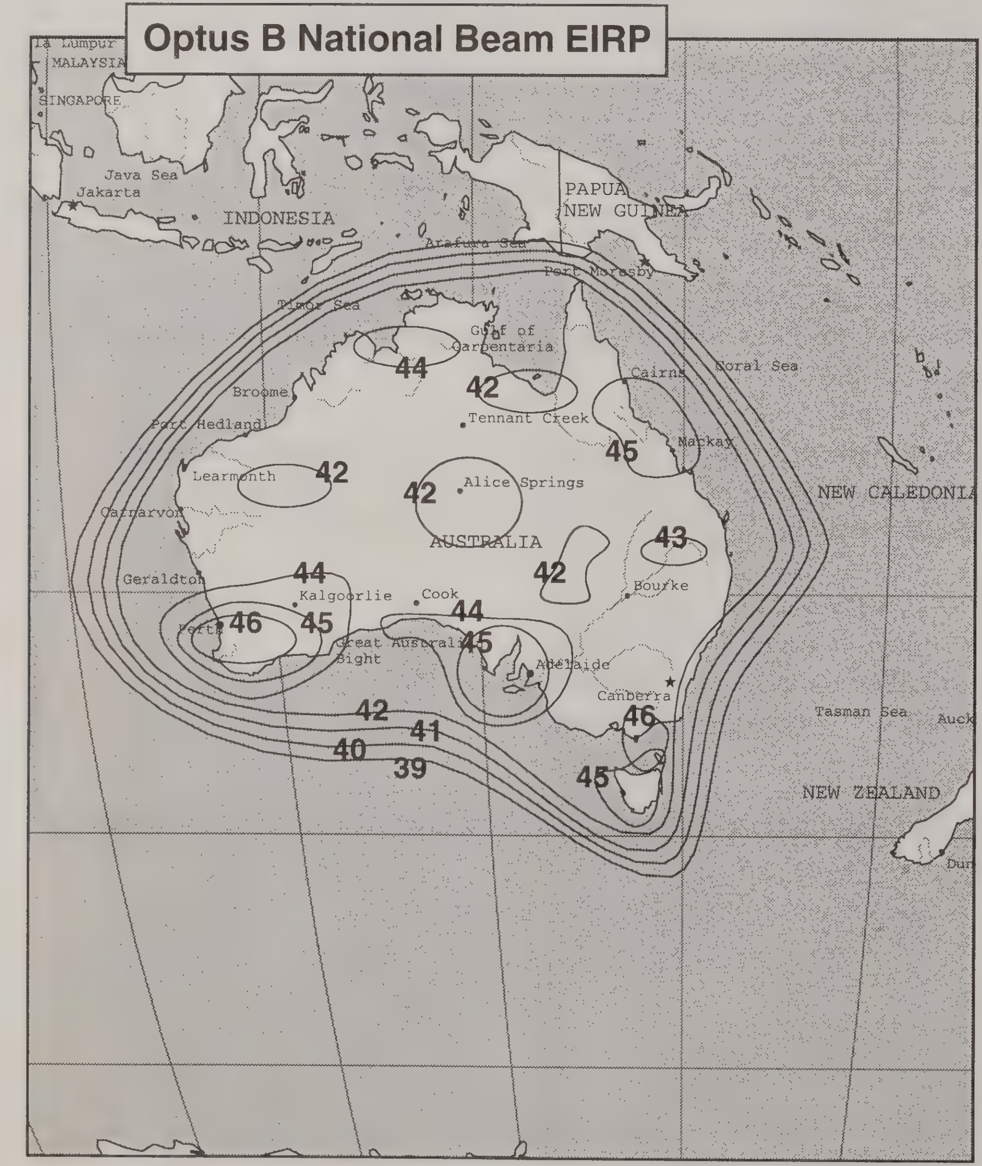
Optus B1 and B3

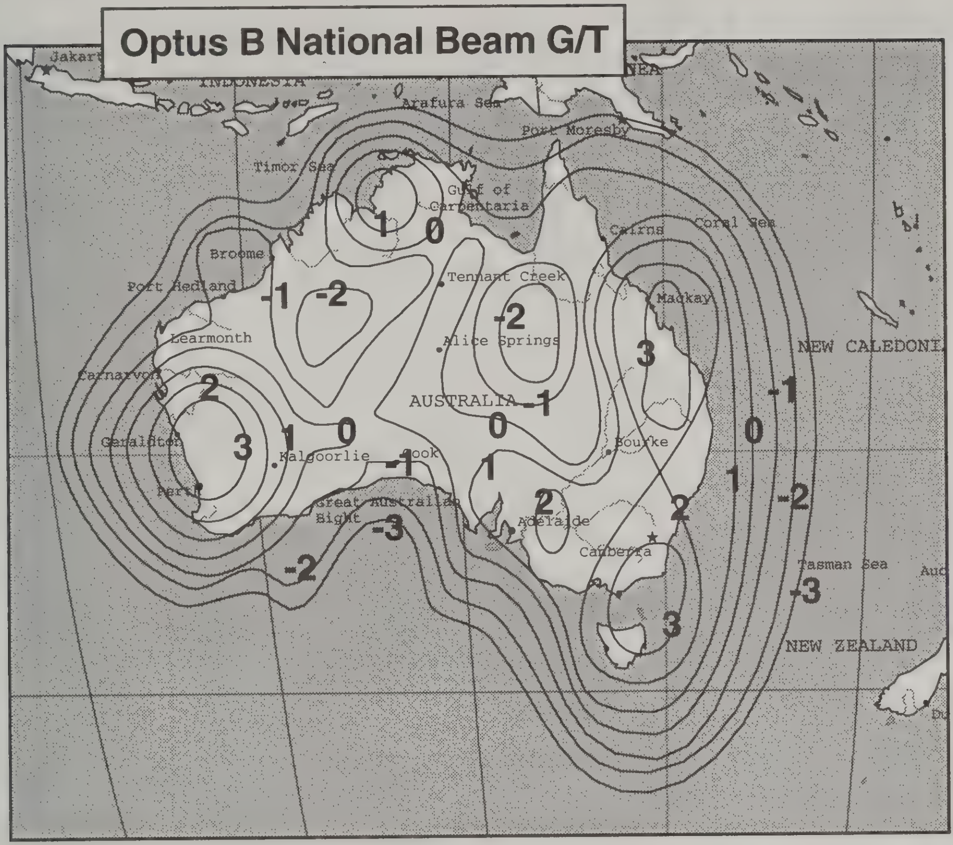
Orbital location: 160°E (B1), 156°E (B3)
Launch: August 14, 1992, Long March 2E (B1),
August 28, 1994, Long March 2E (B3)
Expected lifetime: 13 years
Expected end of life: 2005 (B1), 2007 (B3)

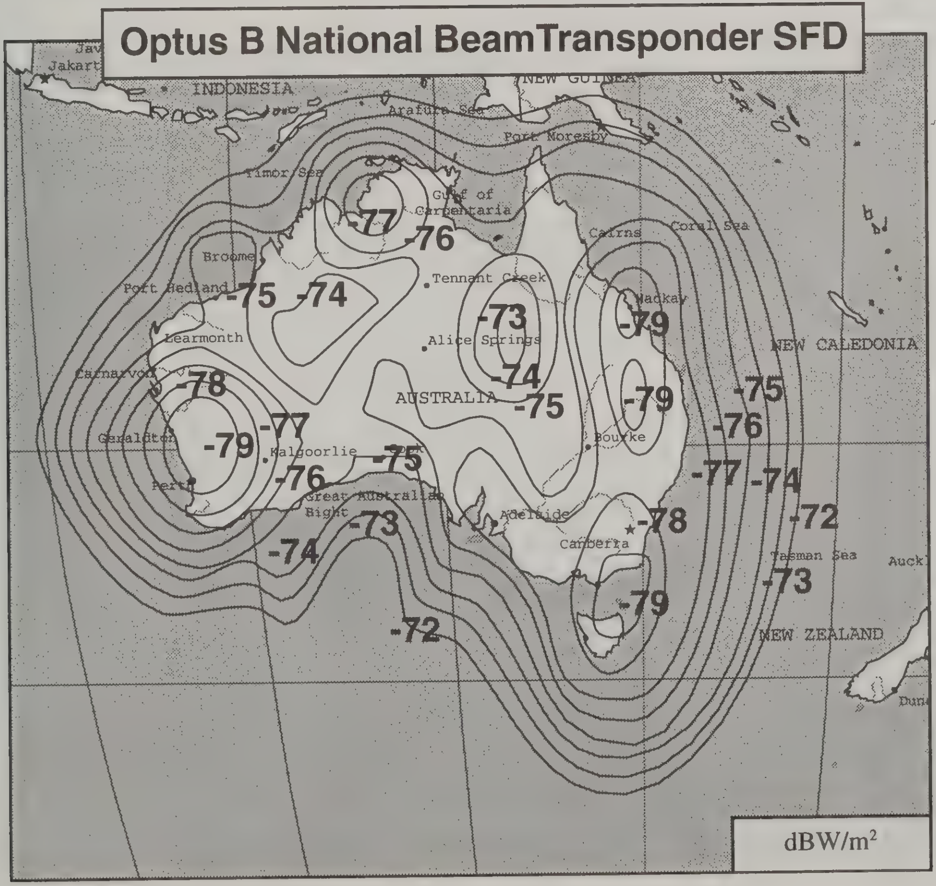
Antennas beam coverage overview:

Ku-band, L-band: Australia, New Zealand

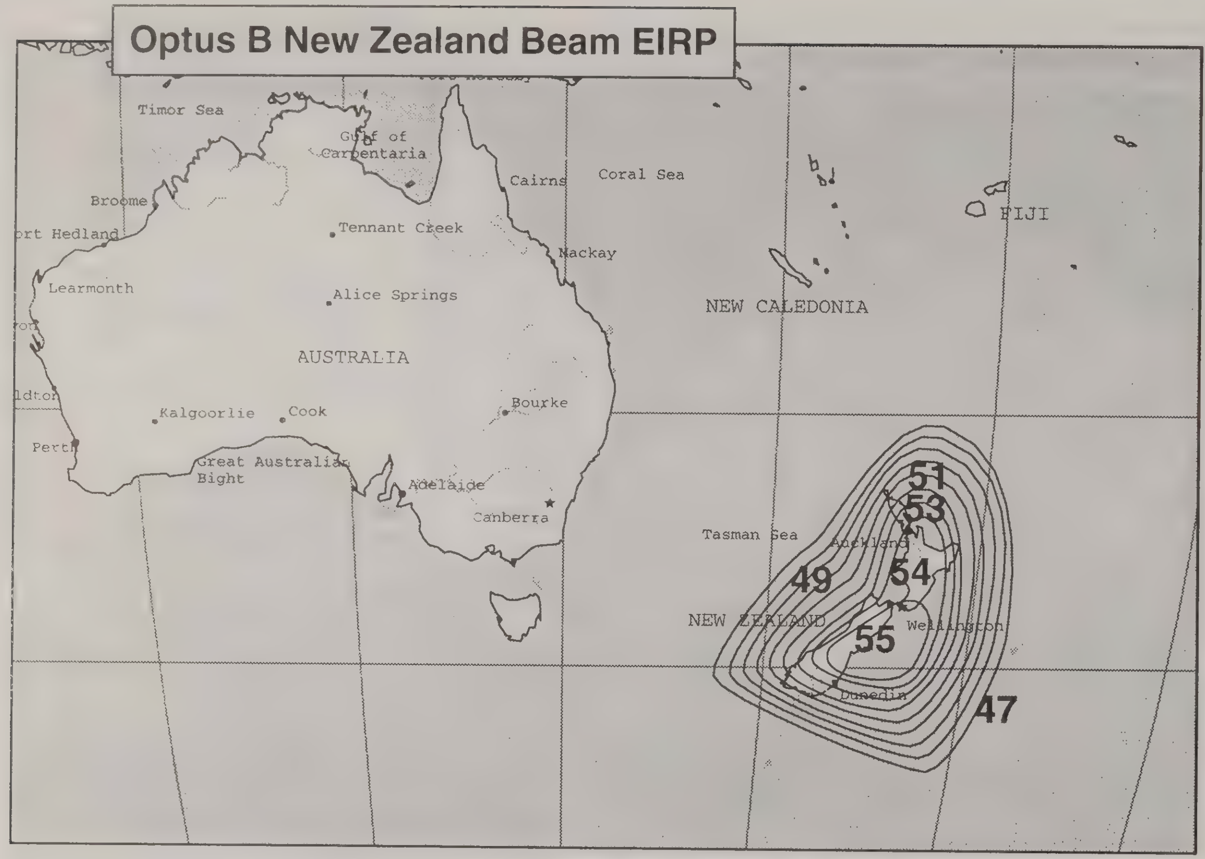
Optus B National Beam EIRP



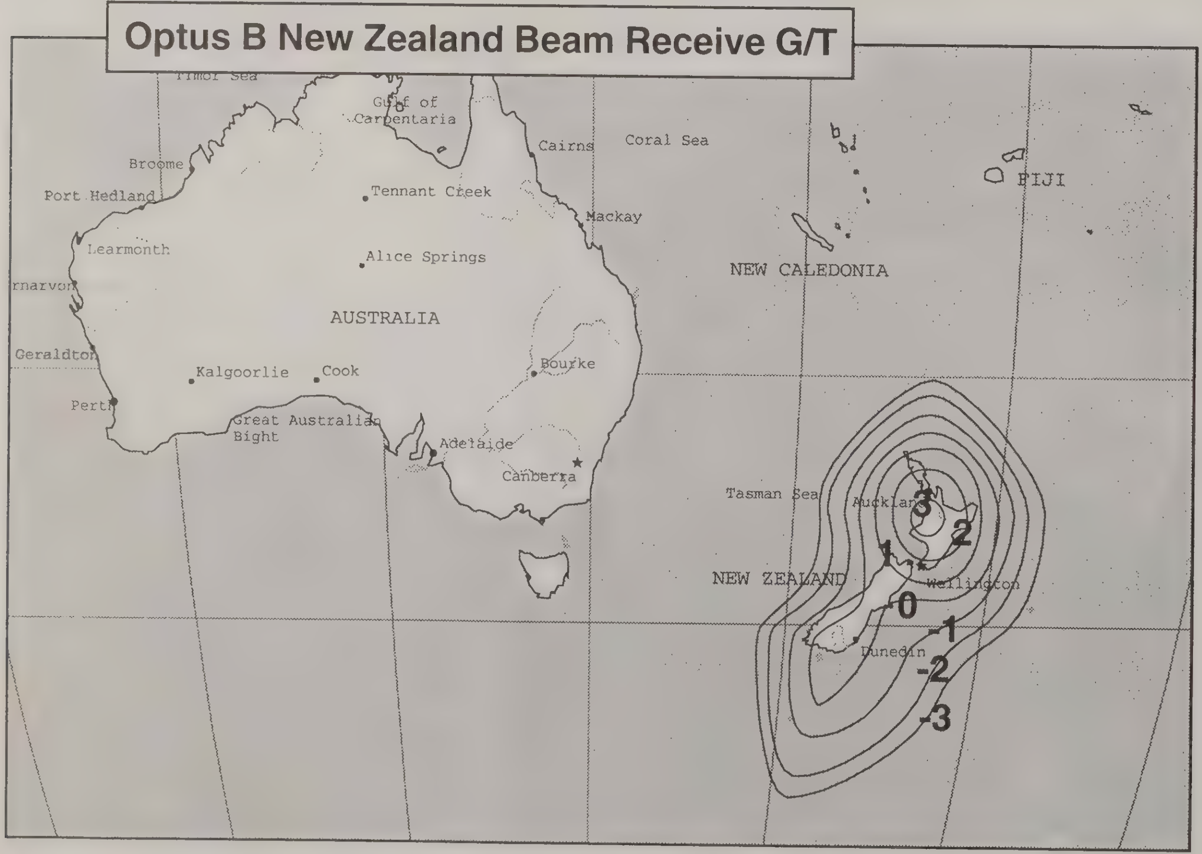

Optus B National Beam G/T


Optus B National BeamTransponder SFD

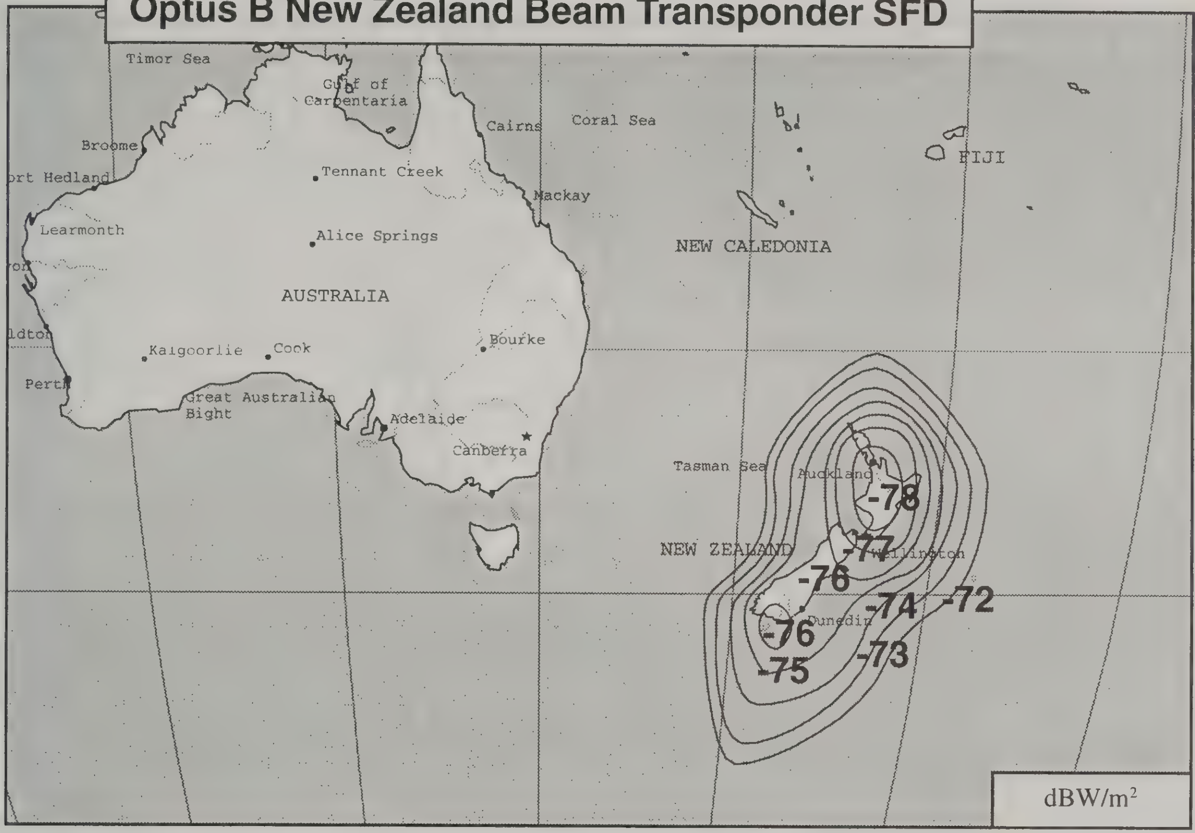
Optus B New Zealand Beam EIRP



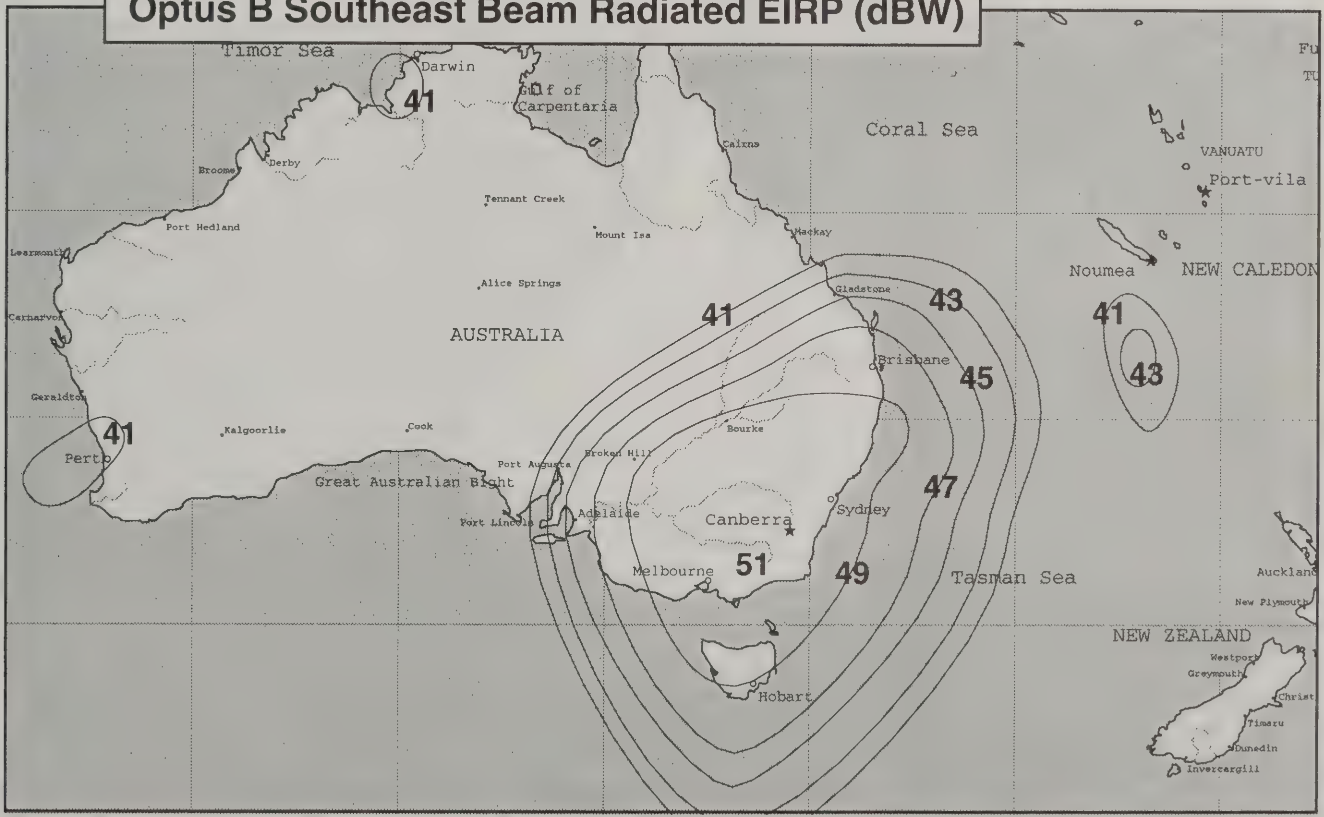
Optus B New Zealand Beam Receive G/T



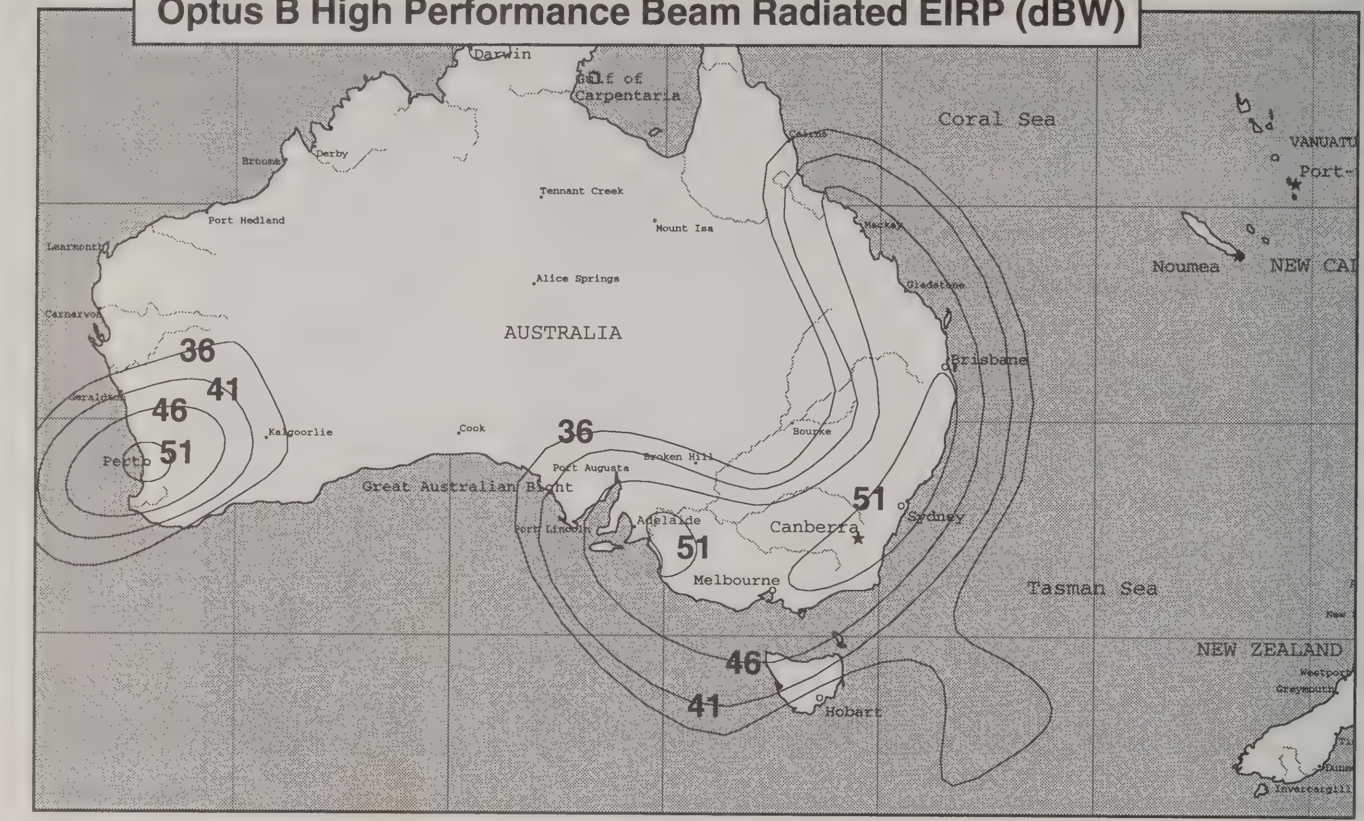
Optus B New Zealand Beam Transponder SFD



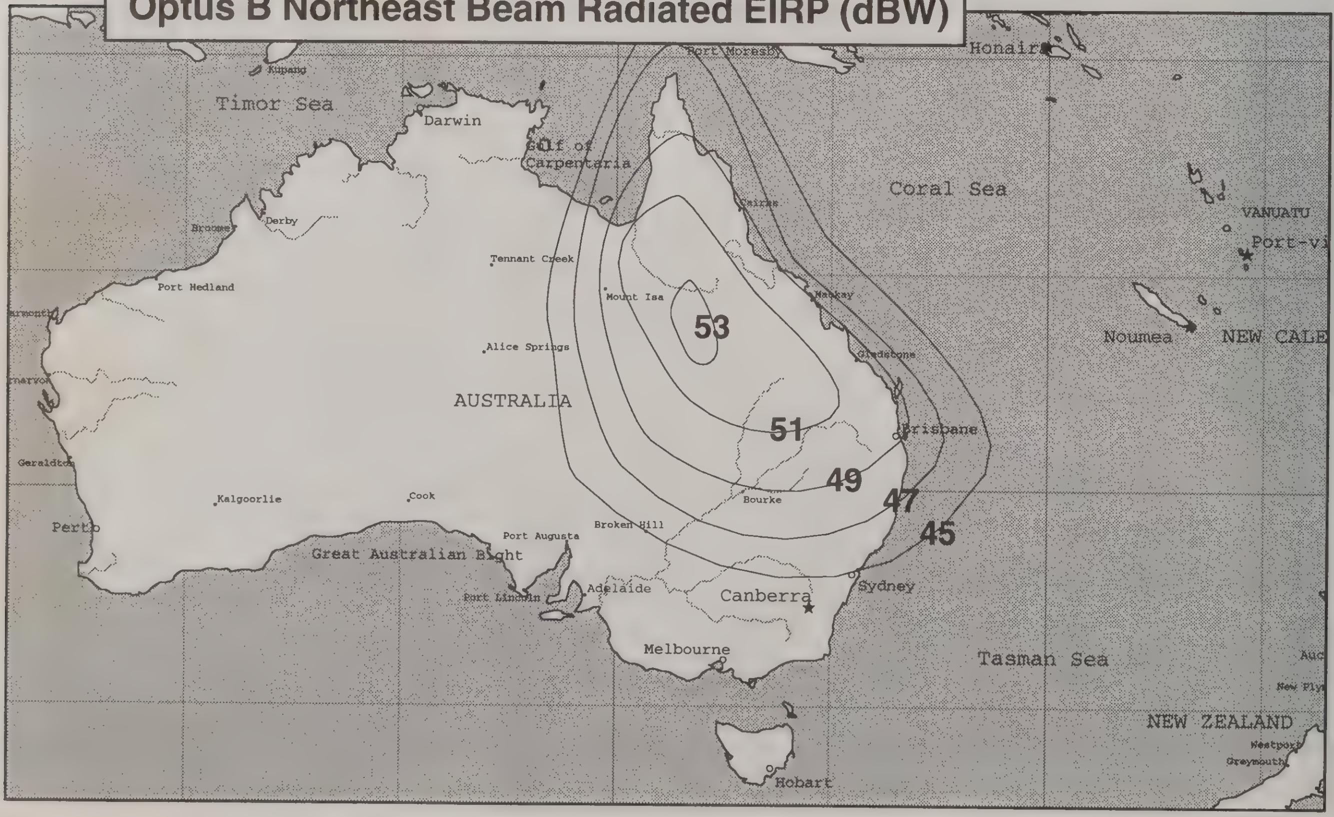
Optus B Southeast Beam Radiated EIRP (dBW)



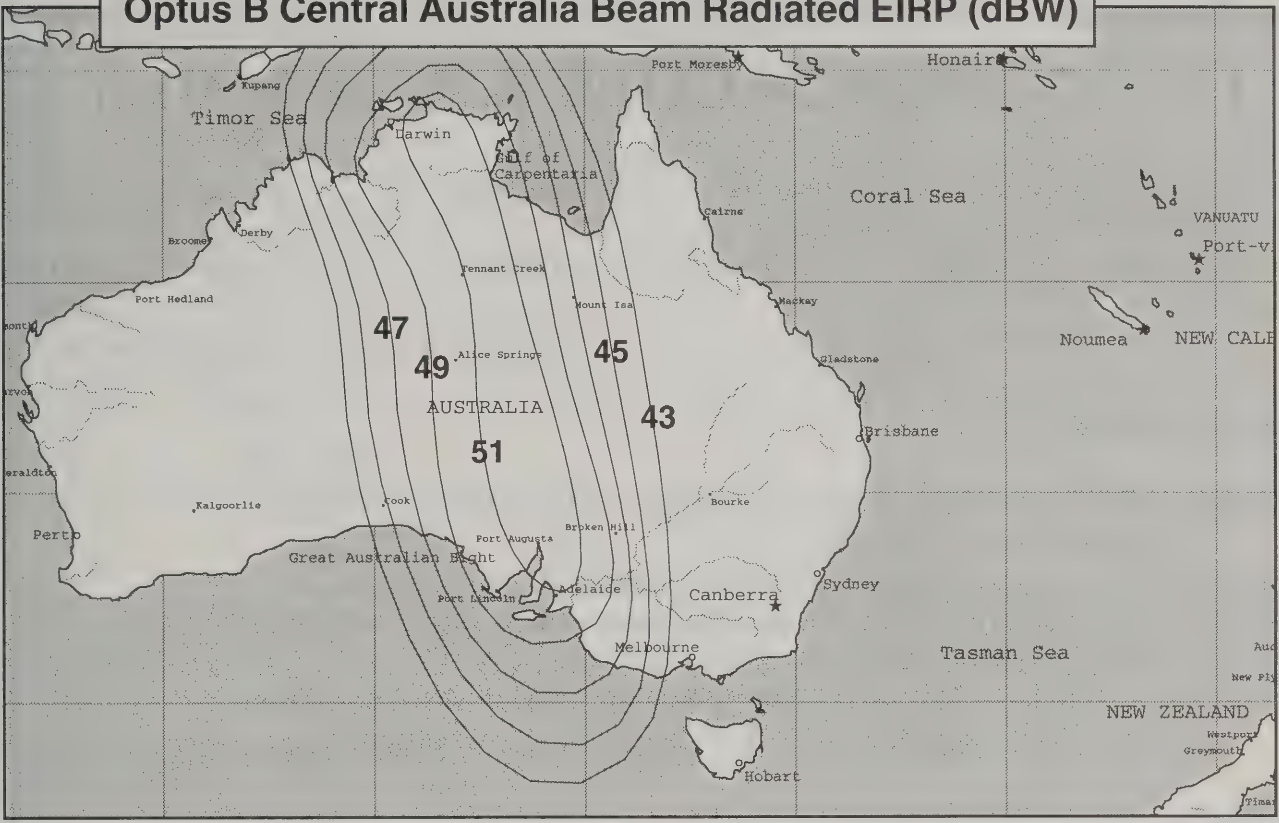
Optus B High Performance Beam Radiated EIRP (dBW)



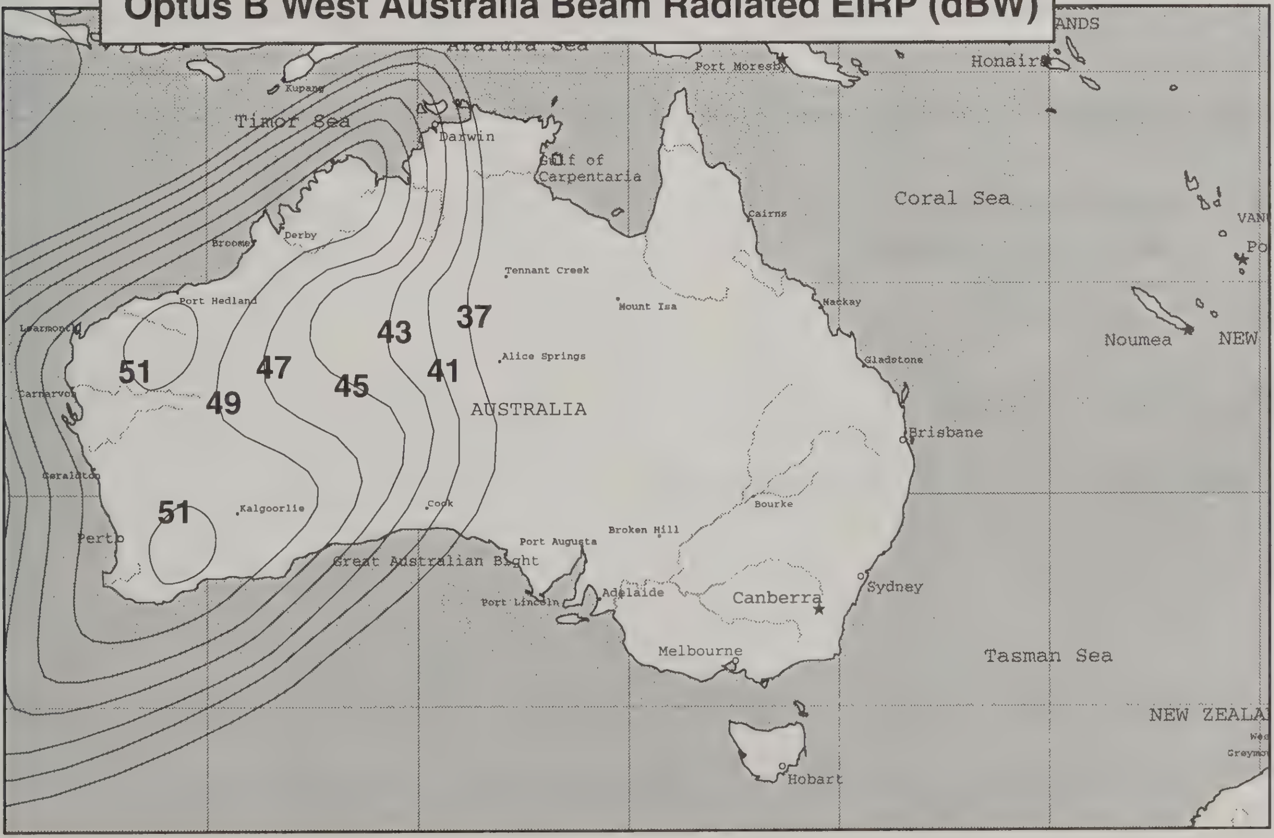
Optus B Northeast Beam Radiated EIRP (dBW)



Optus B Central Australia Beam Radiated EIRP (dBW)



Optus B West Australia Beam Radiated EIRP (dBW)



EMPRESA BRASILEIRA DE TELECOMUNICACOES S.A. (EMBRATEL)

Telecommunications Services Directory (Brazilsat)
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Centro - Rio de Janeiro 20179-900
BRAZIL

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Facsimile:	+55 (21) 2530796
Telex:	9922021
Web Site Address:	www.embratel.net.br/

Booking Contacts:

Edson Soffiatti, International Director, +55 (21)5197433, +55 (21)5197873, facsimile: +55 (21)5197799
Luiz Francisco Tenorio Perrone, Telecommunications Services Director
Carlos Altino Paiva, Head of the Services Management Department, +55 (21)5197219, +55 (21)5196568, facsimile: +55 (21)2537042
Luiz Carlos Ferreira de Mattos, Head of the Satellite Transmission Department, +55 (21)5197750, +55 (21)5197631, facsimile: +55 (21)5198831

Overview:

Embratel is a Brazilian government agency which operates Brazilsat, a domestic satellite system.

Services Offered:

- Data and telematics
- Mobile communications
- Sound and video
- Voice and text

Satellite Control Network:

Satellite control:	Guaratiba (Guba)

BRAZILSAT A SYSTEM At A Glance

Satellite name:	Brazilsat A1, 290°E (70°W)*; Brazilsat A2, 295°E (65°W)+
Spacecraft data:	
Mass (in orbit):	665 kg (A1); 695 kg (A2)
Stabilization:	Spin
Launch date:	February 8, 1985 (A1); March 28, 1986 (A2)
Launch vehicle:	Ariane 3
Expected lifetime:	8 years (still operational)
Transponders:	
Number:	24
Power output:	10 W TWT
Polarization:	Linear
Redundancy:	34:28 ring redundancy
Broadcast frequencies:	Uplink (5.925-6.425 GHz), Downlink (3.700-4.200 GHz)
G/T:	-4 dB/°K
Single carrier saturation flux density:	-82 dBW/m^2
Manufacturer:	Hughes Aircraft Company

* Leased to Hughes Communications Galaxy

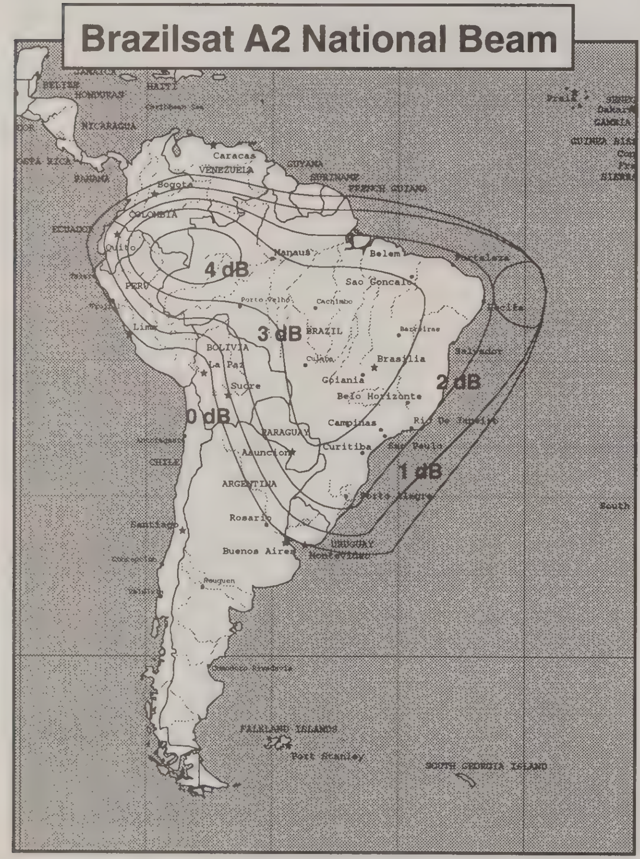
+ Inclined orbit since July 1996

Brazilsat A1 and A2

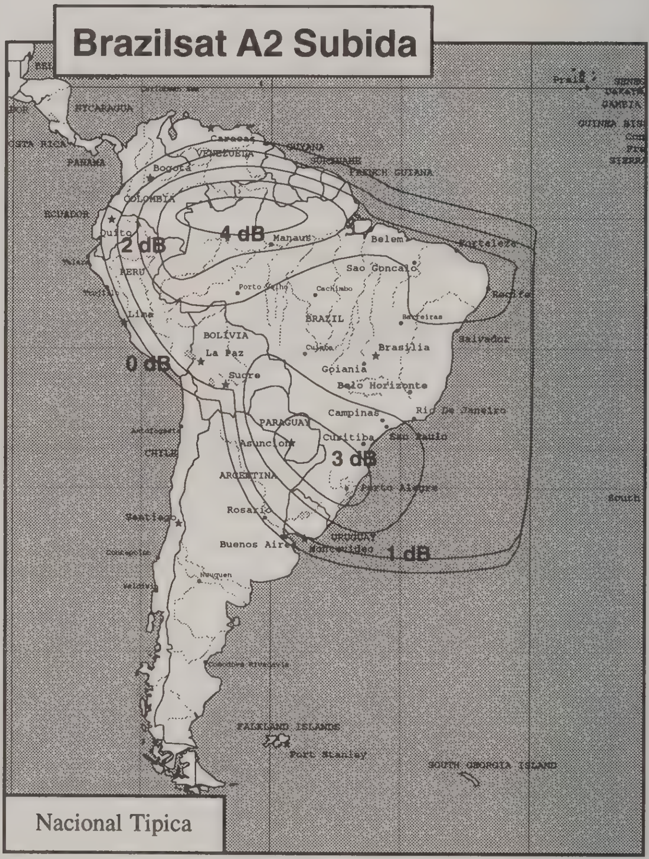
Orbital location:	290ºE (70°W) [A1]; 295°E (65°W), inclined orbit [A2]
Launch:	February 8, 1985 (A1); March 28, 1986 (A2)
Expected lifetime:	8 years (still operational)

Antennas beam coverage overview:

C-band:	Brazil and neighboring countries



Brazilsat A2 National Beam



Brazilsat A2 Subida

Nacional Tipica

BRAZILSAT B SYSTEM At A Glance

Satellite name:	Brazilsat B1, 290°E (70°W); Brazilsat B2, 295°E (65°W); Brazilsat B3, 295°E (65°W) [to be launched]
Spacecraft data:	
Mass (in orbit):	900 kg (B1); 915 kg (B2)
Primary power (EOL):	1,500 W
Eclipse protection:	All transponders
Stabilization:	Spin
Launch date:	August 10, 1994 (B1); March 28, 1995 (B2); end of 1997 (B3)
Launch vehicle:	Ariane 4
Expected lifetime:	12 years
Transponders:	
Number:	28
Power output:	24 at 13 W and 4 at 15.5 W SSPA (B1 and B2); 24 at 14.5 W and 4 at 16.5 W SSPA (B3)
Polarization:	Linear
Redundancy:	34:28 ring redundancy
Broadcast frequencies:	C-band: uplink (5.850-6.425 GHz), downlink (3.625-4.200 GHz)
Single carrier saturation flux density:	-92 dBW/m^2 (minimum)
Manufacturer:	Hughes Aircraft Company

Brazilsat B2 Transponder Frequency Plan

Tr.#	Pol.	EIRP	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1AE	H	33-41	33	5.8665	3.6414
1BE	V	33-41	36	5.885	3.660
2AE	H	33-41	36	5.905	3.680
2BE	V	33-41	36	5.925	3.700
1A	H	33-41	36	5.945	3.720
1B	V	33-41	36	5.965	3.740
2A	H	33-41	36	5.985	3.760
2B	V	33-41	36	6.005	3.780
3A	H	33-41	36	6.025	3.800
3B	V	33-41	36	6.045	3.820
4A	H	33-41	36	6.065	3.840
4B	V	33-41	36	6.085	3.860
5A	H	33-41	36	6.105	3.880
5B	V	33-41	36	6.125	3.900
6A	H	33-41	36	6.145	3.920
6B	V	33-41	36	6.165	3.940
7A	H	33-41	36	6.185	3.960
7B	V	33-41	36	6.205	3.980
8A	H	33-41	36	6.225	4.000
8B	V	33-41	36	6.245	4.020
9A	H	33-41	36	6.265	4.040
9B	V	33-41	36	6.285	4.060
10A	H	33-41	36	6.305	4.080
10B	V	33-41	36	6.325	4.100
11A	H	33-41	36	6.345	4.120
11B	V	33-41	36	6.365	4.140
12A	H	33-41	36	6.385	4.160
12B	V	33-41	36	6.405	4.180

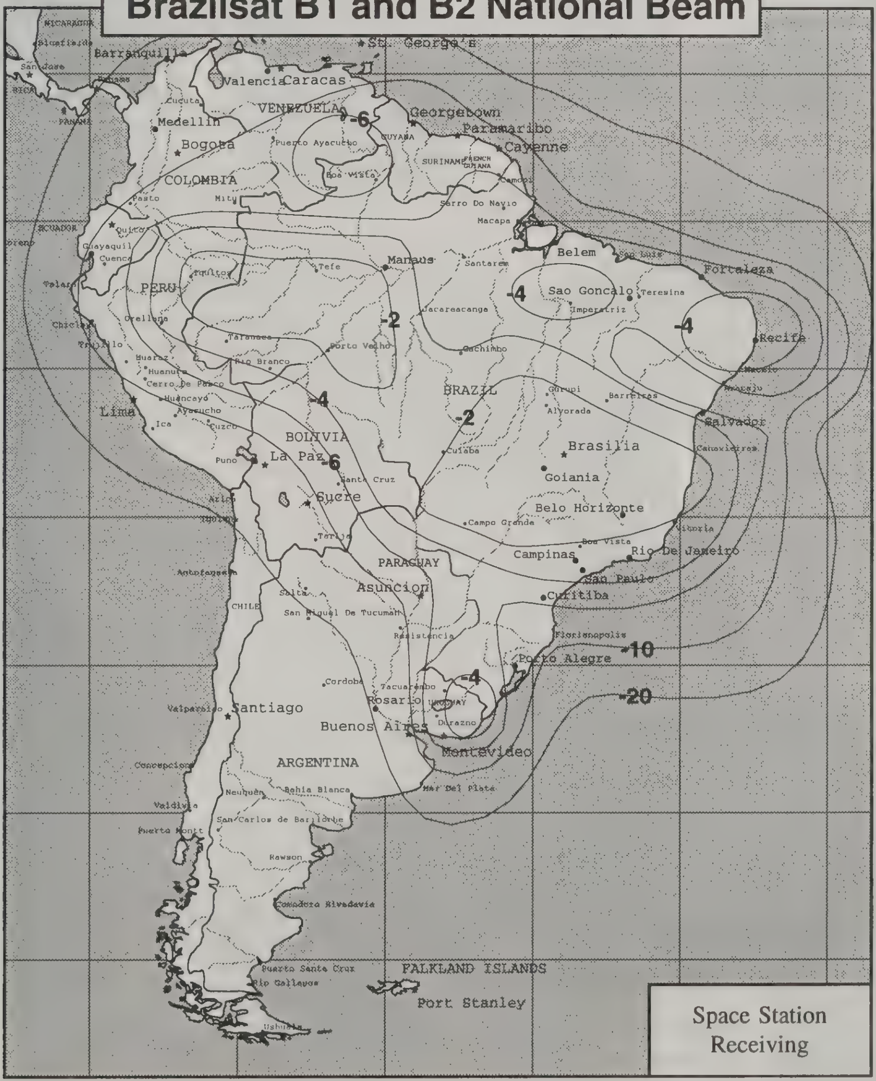
Brazilsat B1 and B2

Orbital location:	290°E (70°W) [B1]; 295°E (65°W) [B2]
Launch:	August 10, 1994 (B1); March 28, 1995 (B2)
Expected lifetime:	12 years
Expected end of life:	2006 (B1), 2007 (B2)

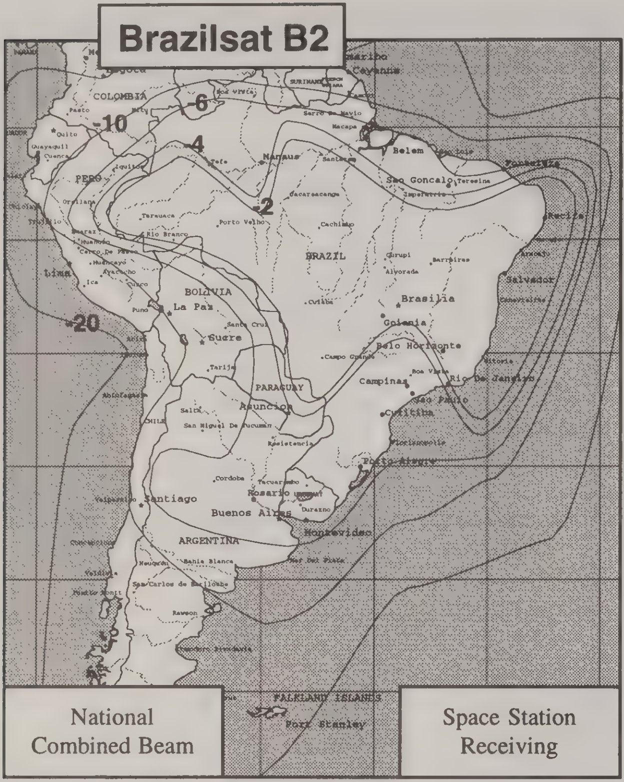
Antennas beam coverage overview:

C-band:	Brazil and neighboring countries

Brazilsat B1 and B2 National Beam



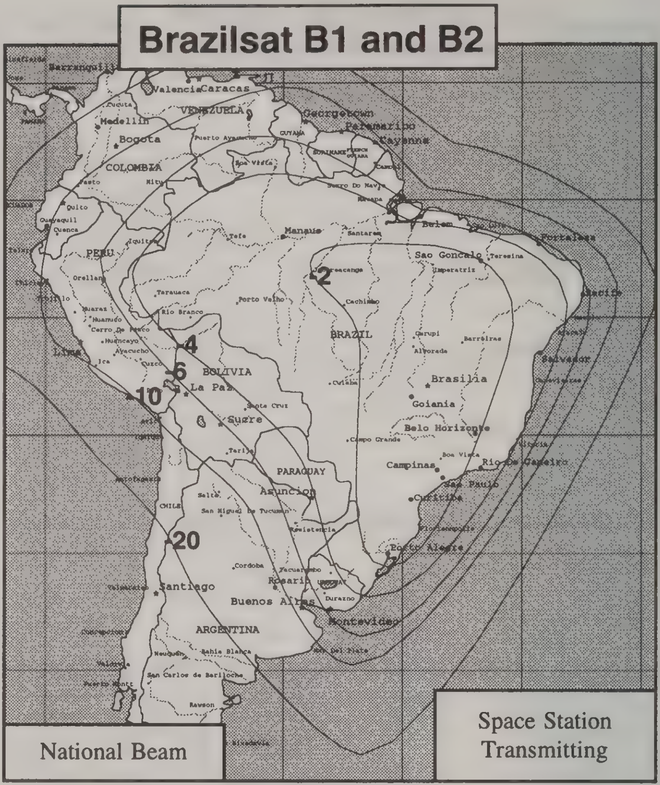
Space Station
Receiving



Brazilsat B2

National Combined Beam

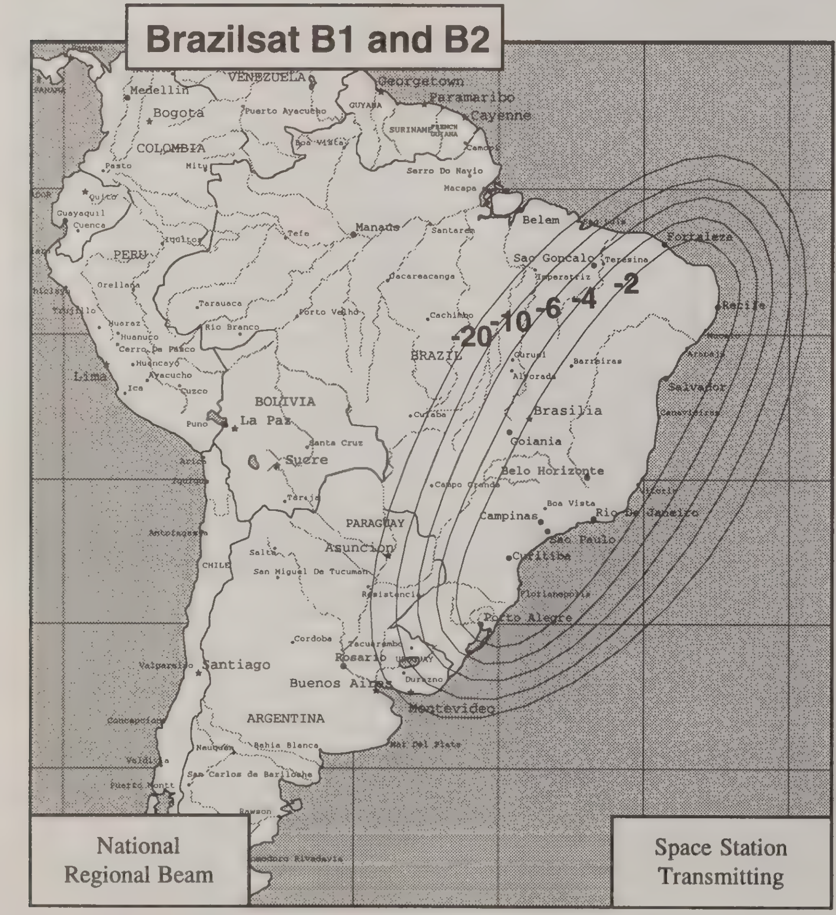
Space Station Receiving



Brazilsat B1 and B2

National Beam

Space Station Transmitting

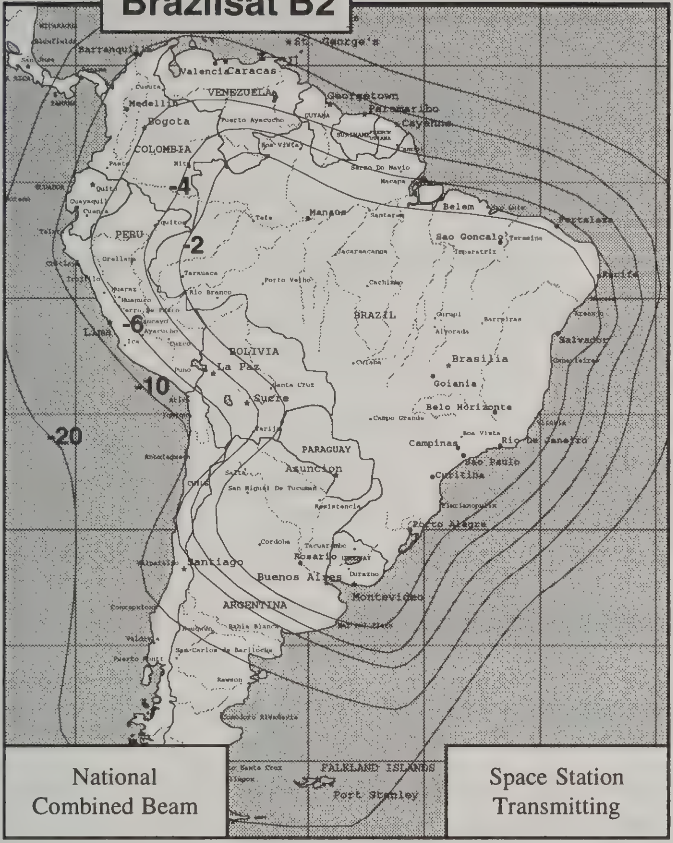


Brazilsat B1 and B2

National Regional Beam

Space Station Transmitting

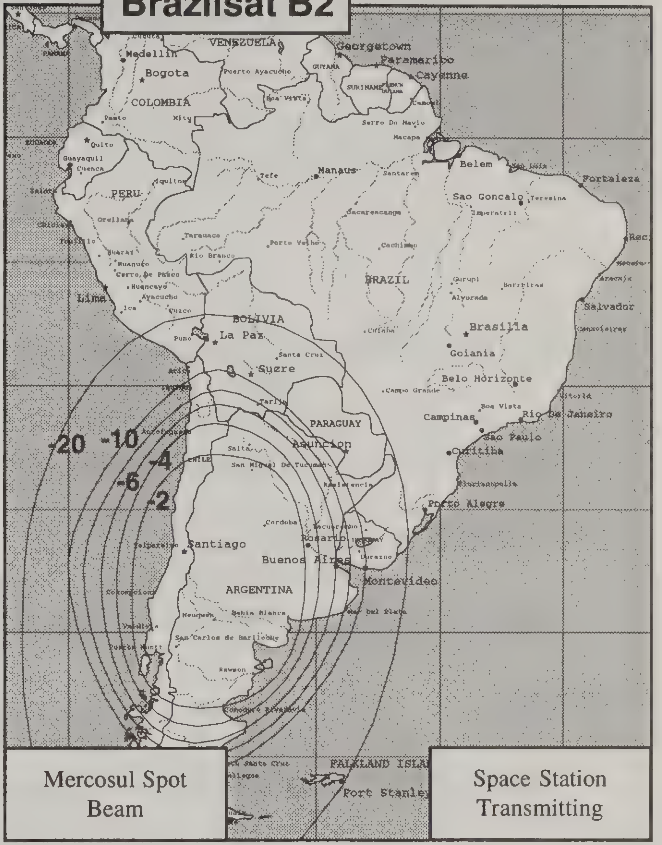
Brazilsat B2



National Combined Beam

Space Station Transmitting

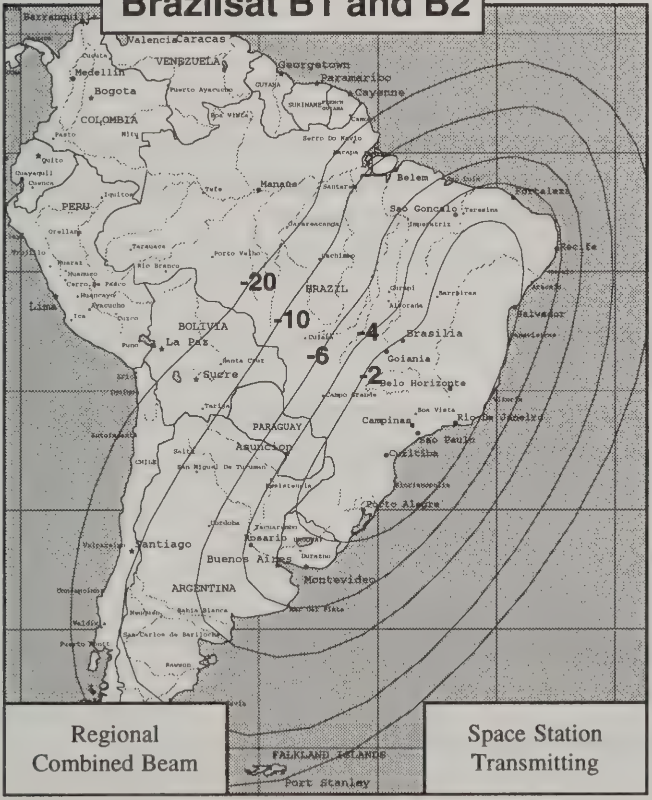
Brazilsat B2



Mercosul Spot Beam

Space Station Transmitting

Brazilsat B1 and B2



Regional Combined Beam

Space Station Transmitting

TELESAT CANADA

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CANADA

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Facsimile:	(613)748-8712
Sales Hotline:	(800)267-1870
Telex:	0534184
Corporate E-mail:	info@telesat.ca

Booking Contacts:

Len Stass, Vice President of Space Systems
Dennis Billard, Vice President of Sales and Marketing

Public Relations Contact:

Marilynn Wright, Vice President of Human Resources and Administration

Overview:

Telesat is Canada's national satellite communications company, providing telecommunications and broadcast distribution services throughout Canada and North America. Telesat owns and operates two Anik E satellites, E1 and E2, which were launched in 1991. Telesat provides international consulting on all aspects of satellite procurement and utilization.

Services Offered:

- Anikom services: VSAT and telephony earth stations offer two-way voice, data and image services. Applications address various corporate communications needs such as data transfer, videoconferencing, teleconferencing, and business television.
- Teleport services: Telesat's national teleport network provides distribution services for both broadcast and telecommunications applications.
- Custom designs: communications solutions developed, designed and implemented to meet specific customer requirements.
- Consulting services: Telesat provides consulting expertise in satellite systems development, management and operations to organizations in more than 20 countries.

Satellite Control Network:

Satellite control:	Gloucester, ON, Canada
TT&C stations:	Allan Park, ON, Canada; Perth, Australia

ANIK E SYSTEM At A Glance

Satellite name: Anik E1, 248.9°E (111.1°W);
Anik E2, 252.7°E (107.3°W)

Spacecraft data:
Mass (in orbit): 1,775 kg
Primary power (BOL): 4,840 W
Eclipse protection: All transponders
Stabilization: 3-axis
Launch date: September 1991 (Anik E1),
April 1991 (Anik E2)
Expected lifetime: 12 years

Transponders:
Number: 24 C-band, 16 Ku-band
Power output: 11.5 W SSPA (C-band),
50 W TWTA (Ku-band)
Polarization: Linear, cross polarized
Redundancy: 1:4 (C-band), 1:8 (Ku-band)

Single carrier saturation flux density: -70 to -85 dBW/sq.m.

Manufacturer: SPAR/Martin Marietta Astrospace

Anik E Ku-Band Transponder Frequency Plan

Tr.#	Ch.	Pol.	BW(MHz)	EIRP(dBW)	Downlink(GHz)
1V	T1	V	54	42-50*	11.717
1V	T2	V	54	42-50*	11.743
1H	T17	H	54	42-50*	11.730
1H	T18	H	54	42-50*	11.756
2V	T3	V	54	42-50*	11.778
2V	T4	V	54	42-50*	11.804
2H	T19	H	54	42-50*	11.791
2H	T20	H	54	42-50*	11.817
3V	T5	V	54	42-50*	11.839
3V	T6	V	54	42-50*	11.865
3H	T21	H	54	42-50*	11.852
3H	T22	H	54	42-50*	11.878
4V	T7	V	54	42-50*	11.900
4V	T8	V	54	42-50*	11.926
4H	T23	H	54	42-50*	11.913
4H	T24	H	54	42-50*	11.939
5V	T9	V	54	42-50*	11.961
5V	T10	V	54	42-50*	11.987
5H	T25	H	54	42-50*	11.974
5H	T26	H	54	42-50*	12.000
6V	T11	V	54	42-50*	12.022
6V	T12	V	54	42-50*	12.048
6H	T27	H	54	42-50*	12.035
6H	T28	H	54	42-50*	12.061
7V	T13	V	54	42-50*	12.083
7V	T14	V	54	42-50*	12.109
7H	T29	H	54	42-50*	12.096
7H	T30	H	54	42-50*	12.122
8V	T15	V	54	42-50*	12.144
8V	T16	V	54	42-50*	12.170
8H	T31	H	54	42-50*	12.157
8H	T32	H	54	42-50*	12.183

*National beam; 45-53 dBW 1/2 Canada beam; 43-46 dBW Extended coverage (U.S./Canada)

Anik E C-Band Transponder Frequency Plan

Tr.#	Pol.	Downlink(GHz)	Tr.#	Pol.	Downlink(GHz)
1A	H	3.7200	1B	V	3.7400
2A	H	3.7600	2B	V	3.7800
3A	H	3.8000	3B	V	3.8200
4A	H	3.8400	4B	V	3.8600
5A	H	3.8800	5B	V	3.9000
6A	H	3.9200	6B	V	3.9400
7A	H	3.9600	7B	V	3.9800
8A	H	4.0000	8B	V	4.0200
9A	H	4.0400	9B	V	4.0600
10A	H	4.0800	10B	V	4.1000
11A	H	4.1200	11B	V	4.1400
12A	H	4.1600	12B	V	4.1800

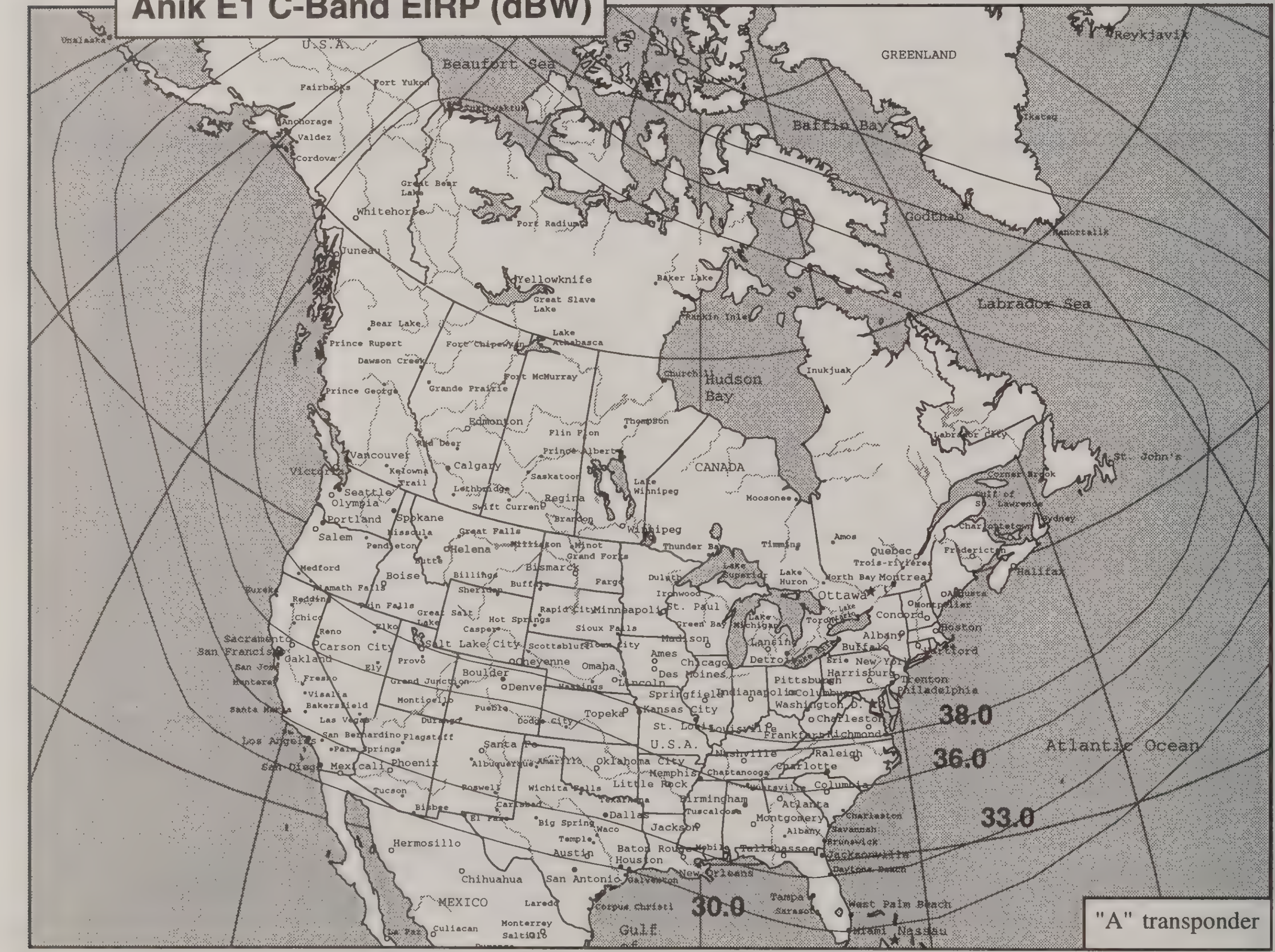
Anik E1

Orbital location:	248.9°E (111.1°W)
Launch:	September 1991, Ariane
Expected lifetime:	12 years
Expected end of life:	2003

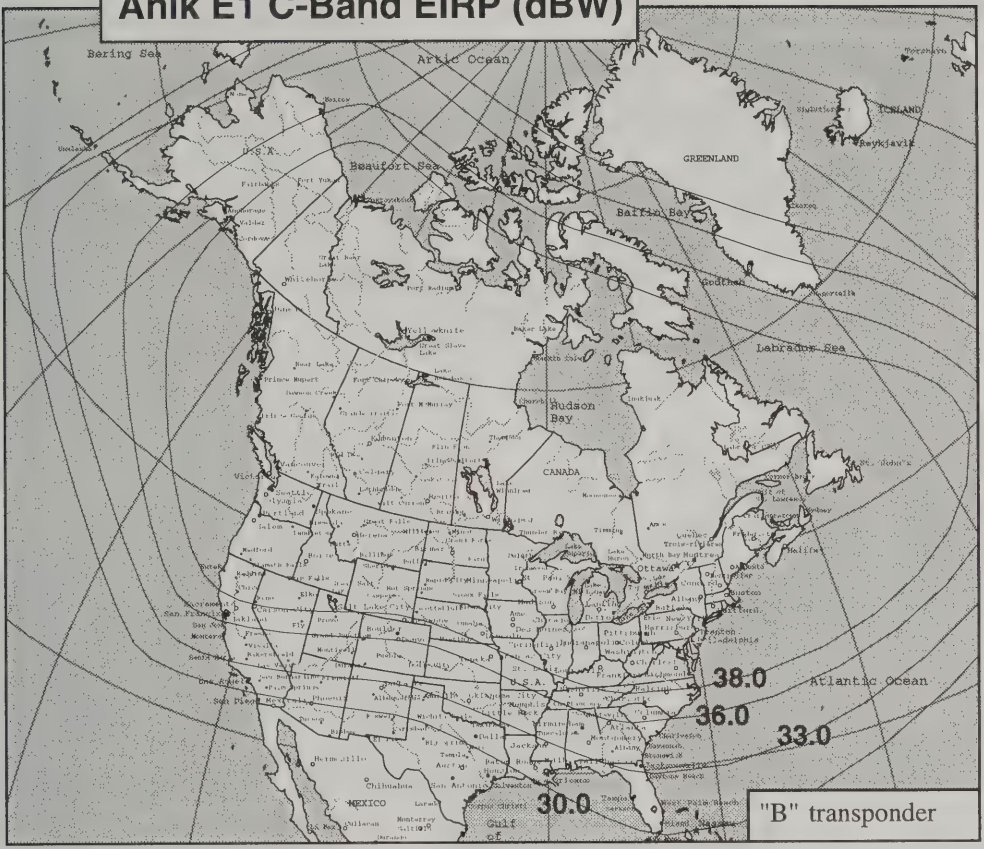
Antennas beam coverage overview:

Ku-band:	Canada and Northern USA
C-band:	Canada and Conus

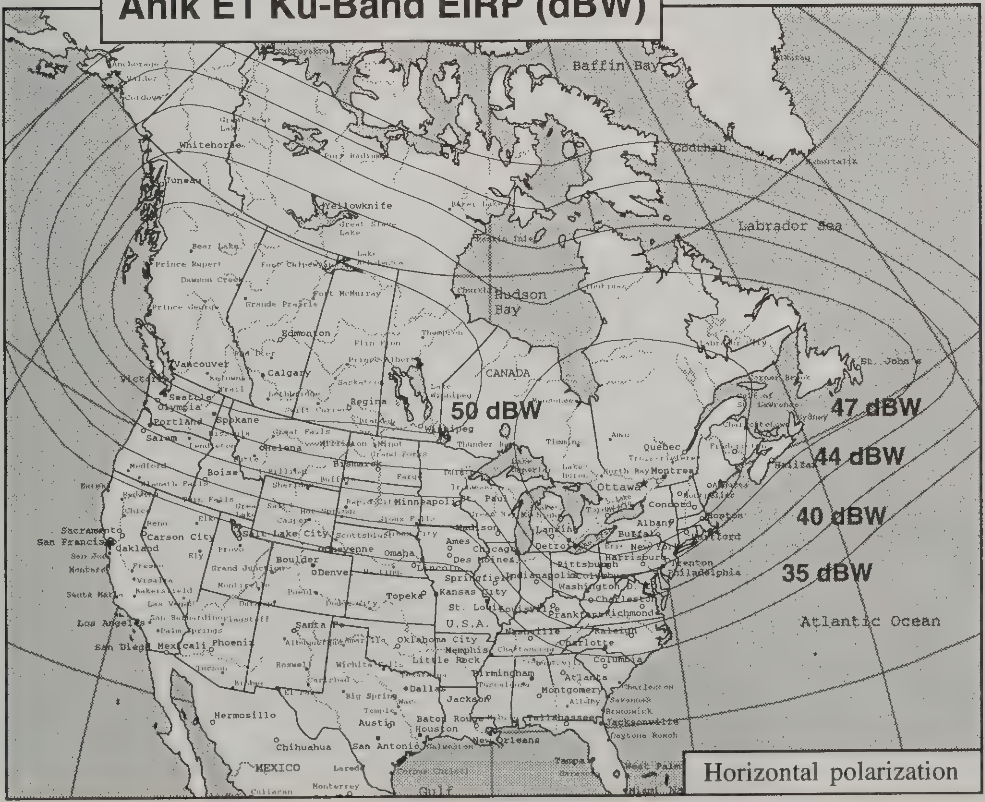
Anik E1 C-Band EIRP (dBW)

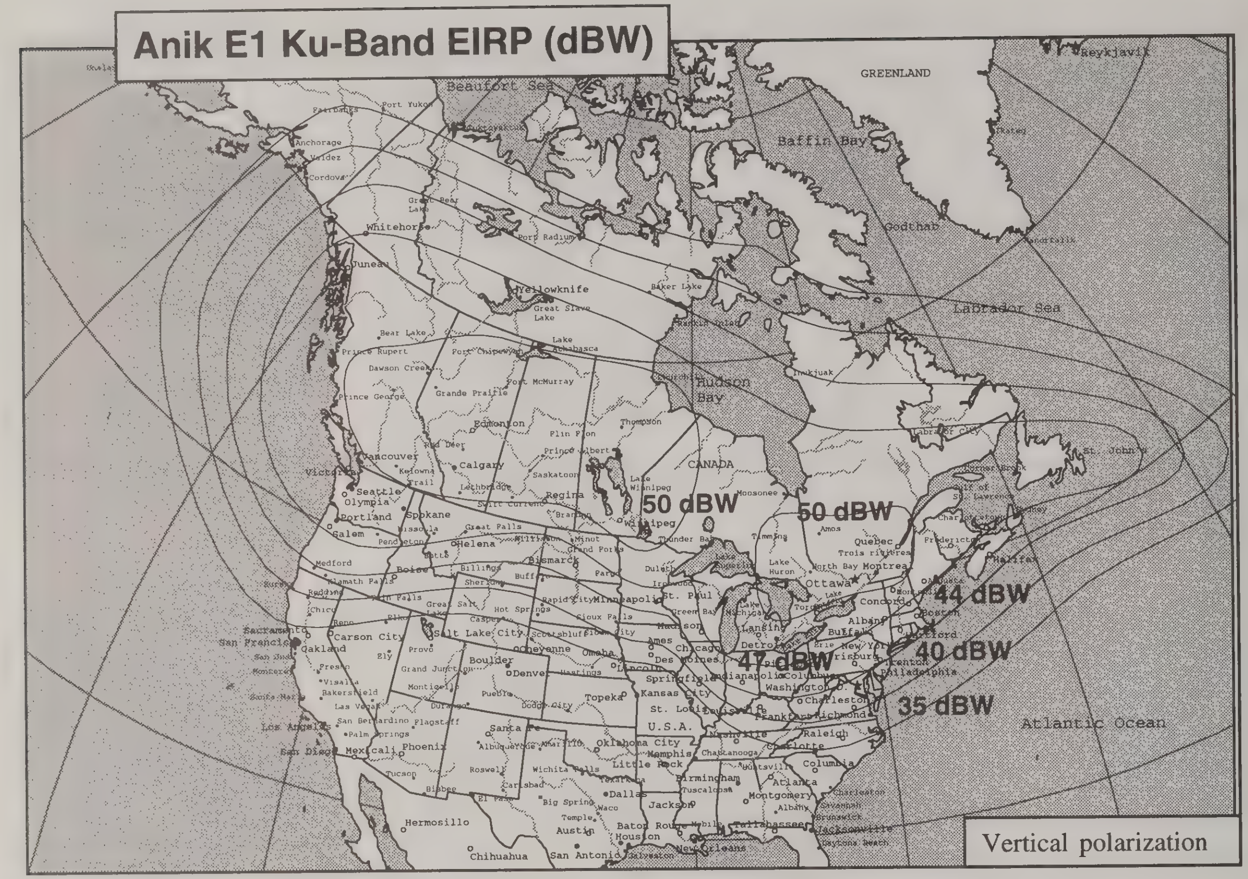


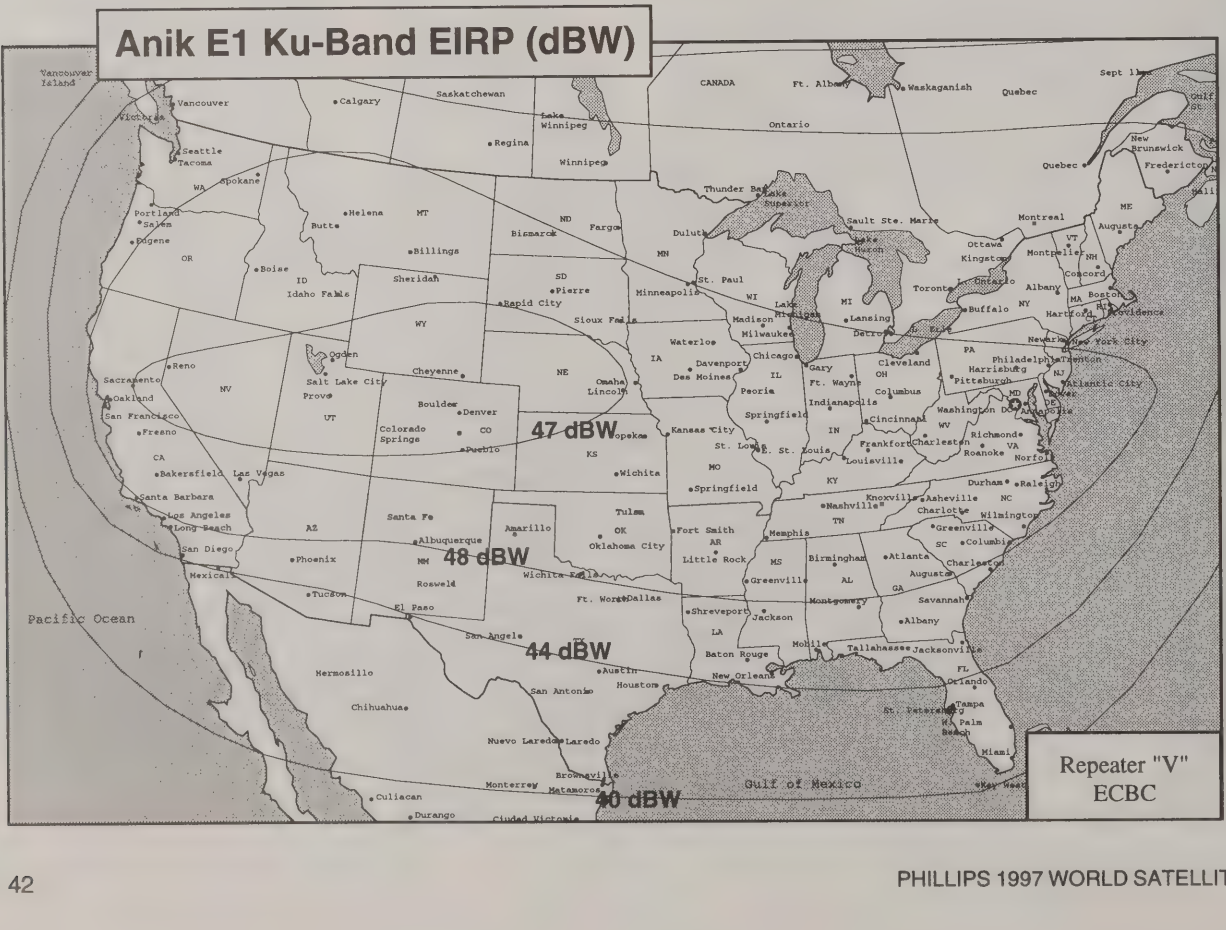
Anik E1 C-Band EIRP (dBW)



Anik E1 Ku-Band EIRP (dBW)




Anik E1 Ku-Band EIRP (dBW)
50 dBW
50 dBW
44 dBW
47 dBW
40 dBW
35 dBW
Vertical polarization
GREENLAND
Baffin Bay
Labrador Sea
Hudson Bay
Beaufort Sea
Atlantic Ocean
CANADA
U.S.A.


Anik E1 Ku-Band EIRP (dBW)
47 dBW
48 dBW
44 dBW
40 dBW
Repeater "V"
ECBC
CANADA
Pacific Ocean
Gulf of Mexico

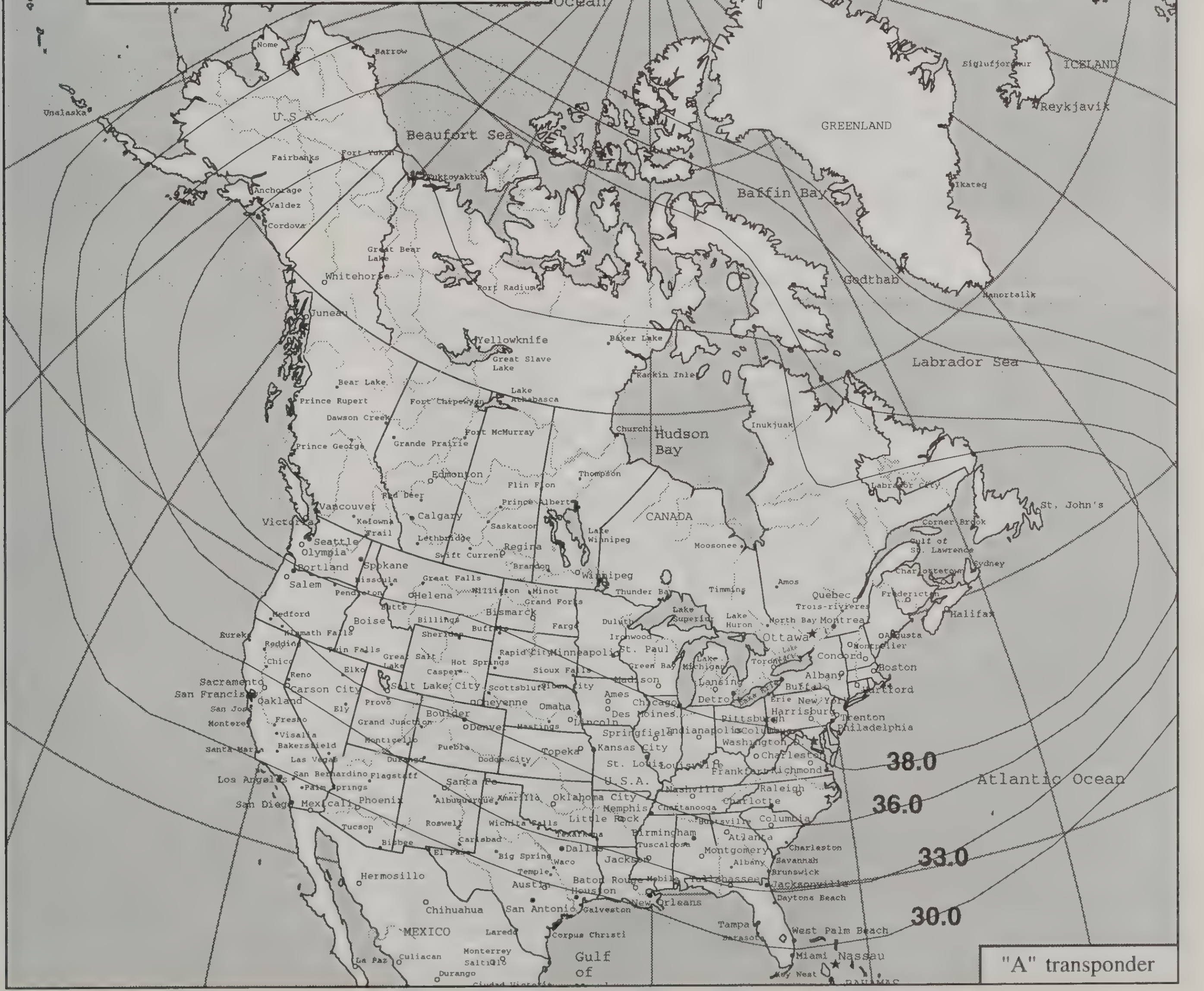
Anik E2

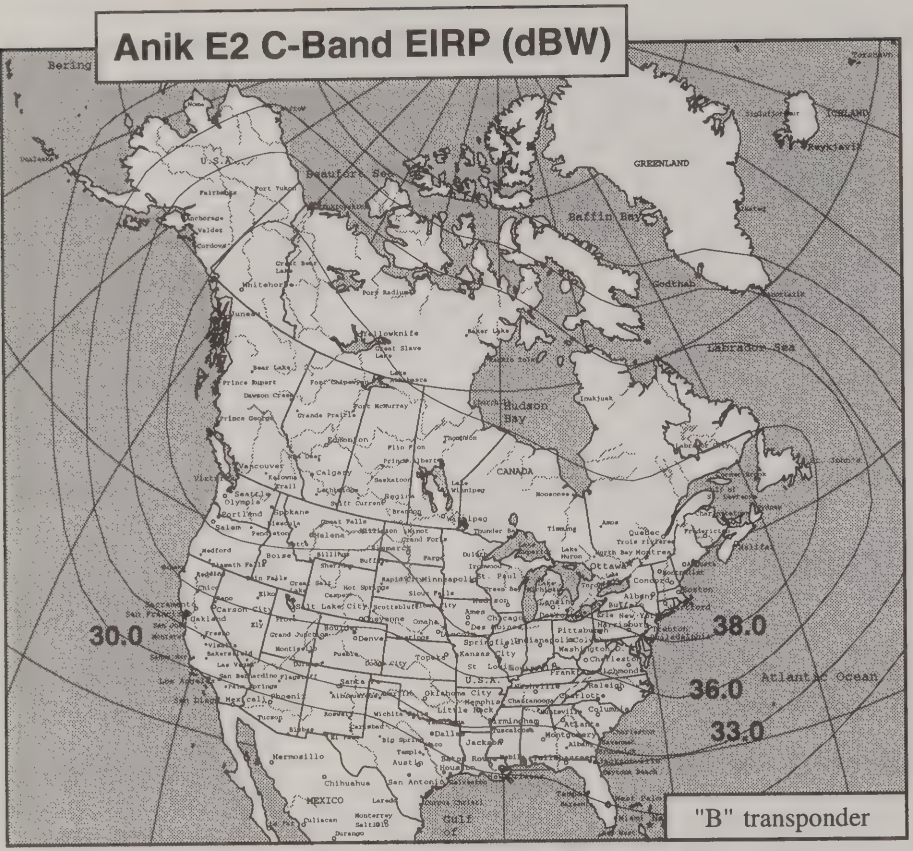
Obital location:	252.7°E (107.3°W)
Launch:	April 1991, Ariane
Expected lifetime:	12 years
Expected end of life:	2003

Antennas beam coverage overview:

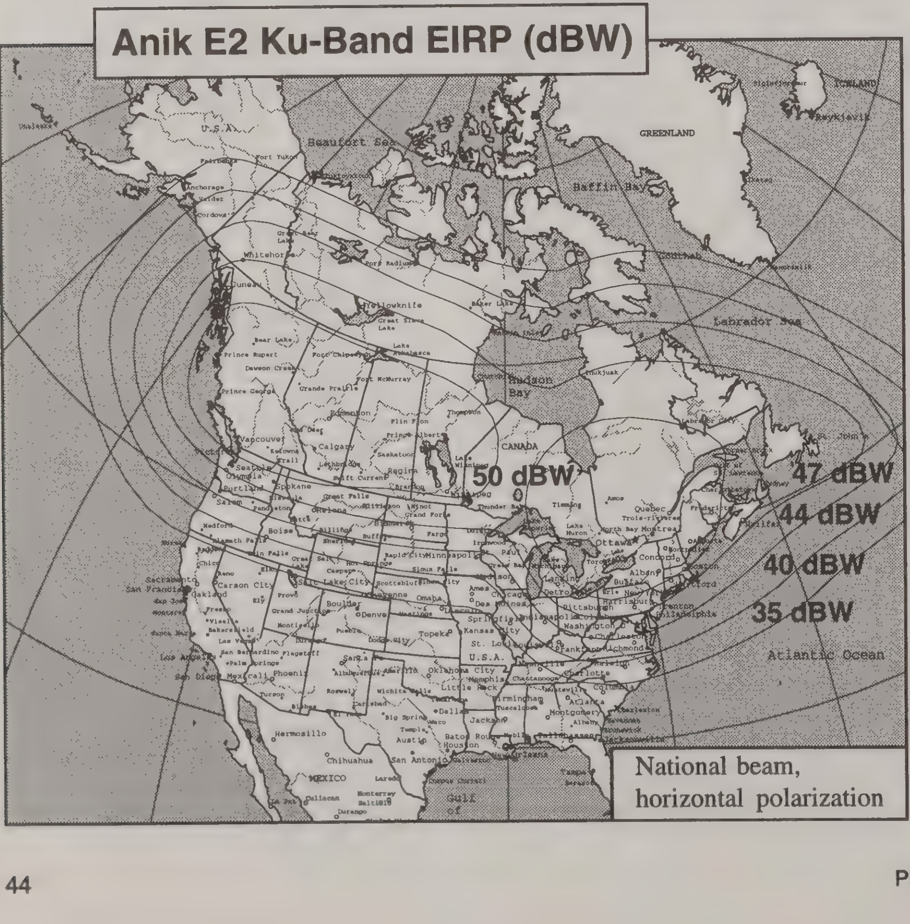
Ku-band:	Canada and Northern USA
C-band:	Canada and Conus

Anik E2 C-Band EIRP (dBW)

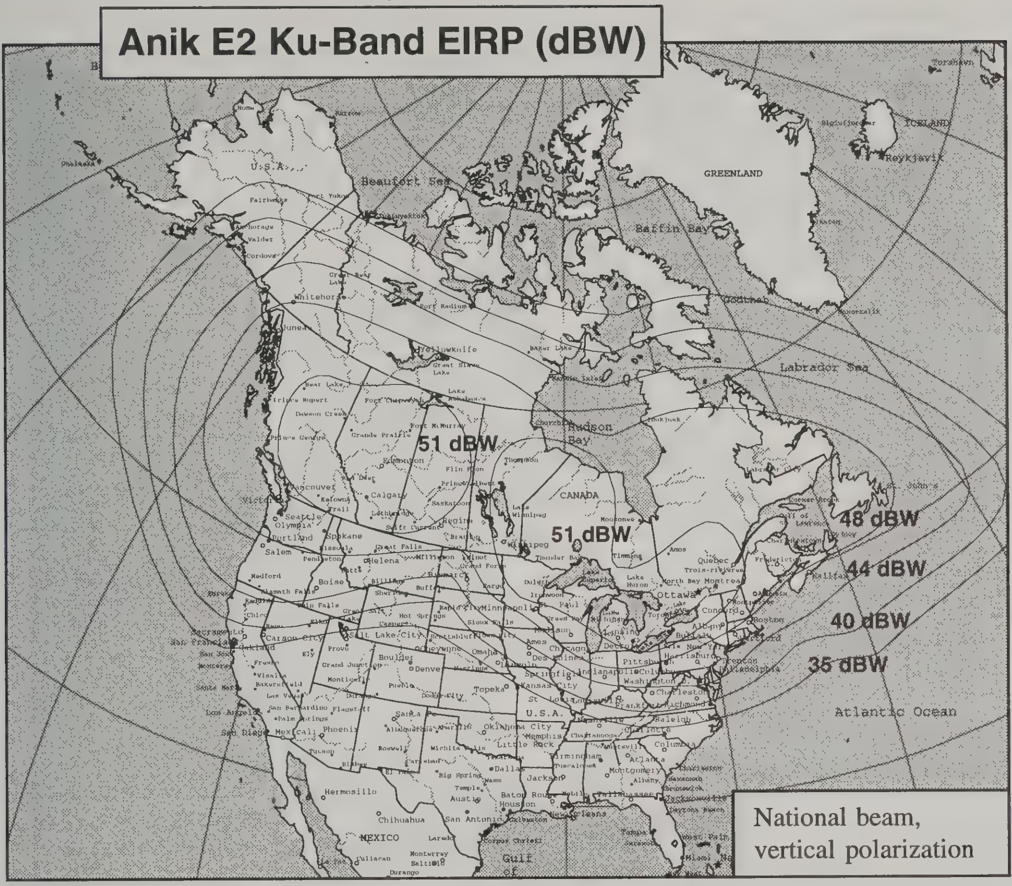




Anik E2 C-Band EIRP (dBW)

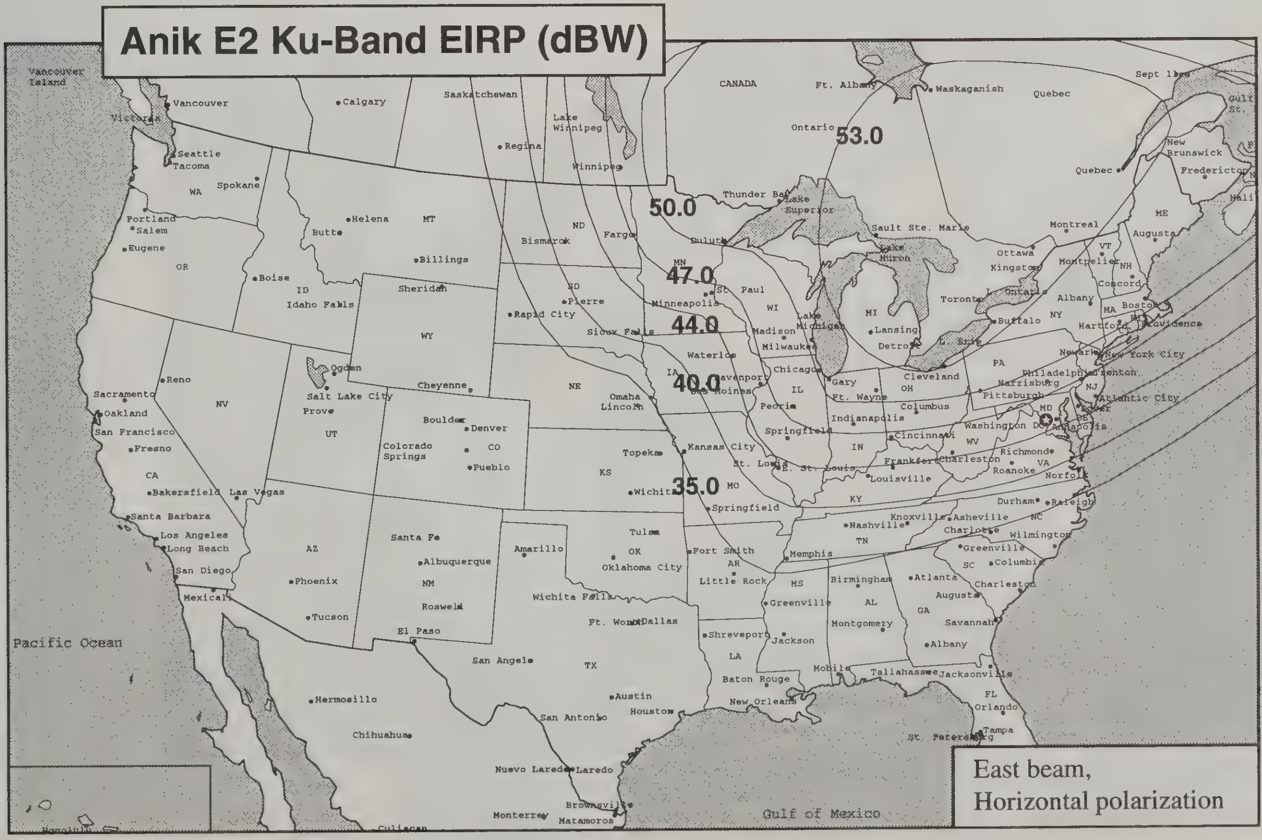


Anik E2 Ku-Band EIRP (dBW)



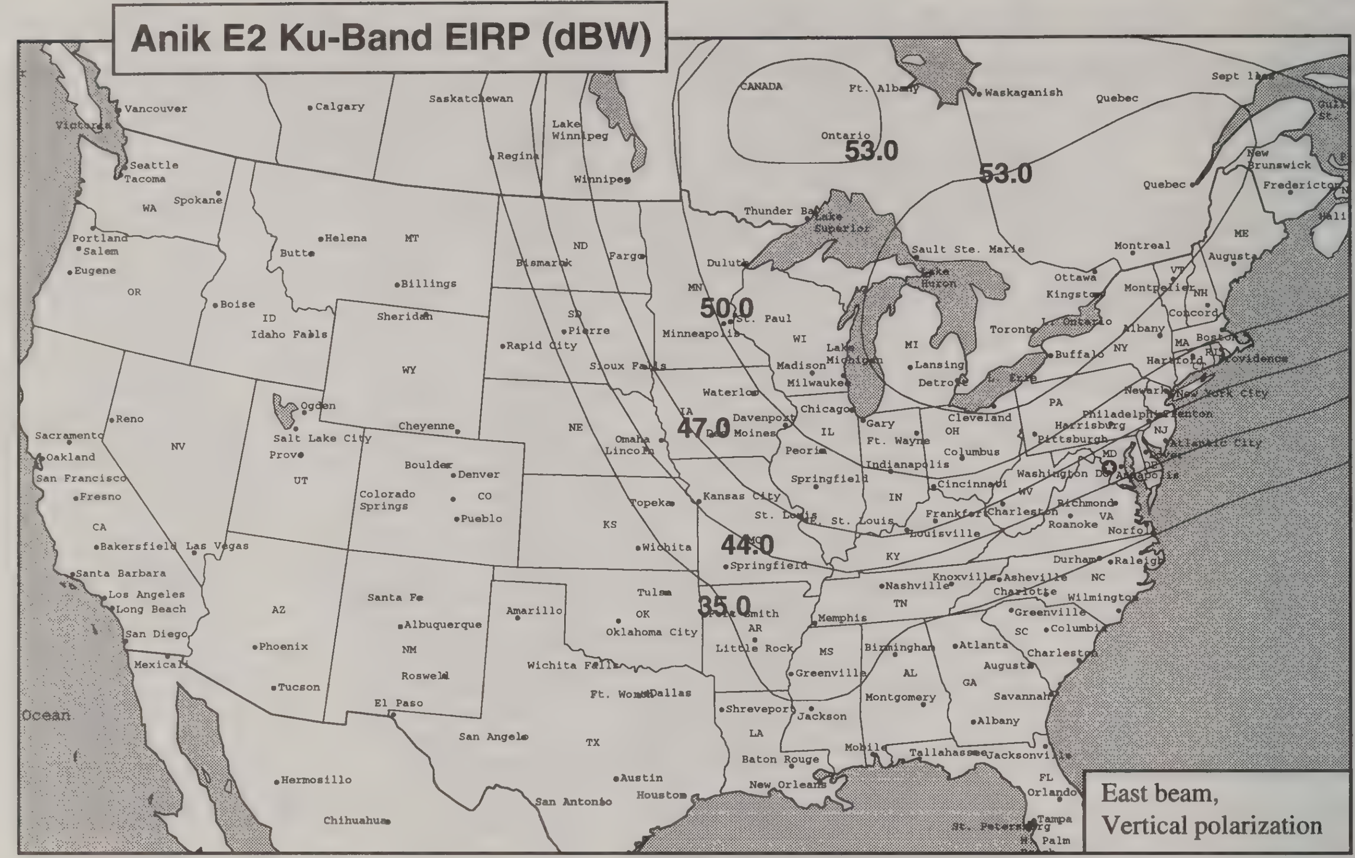
Anik E2 Ku-Band EIRP (dBW)

National beam, vertical polarization



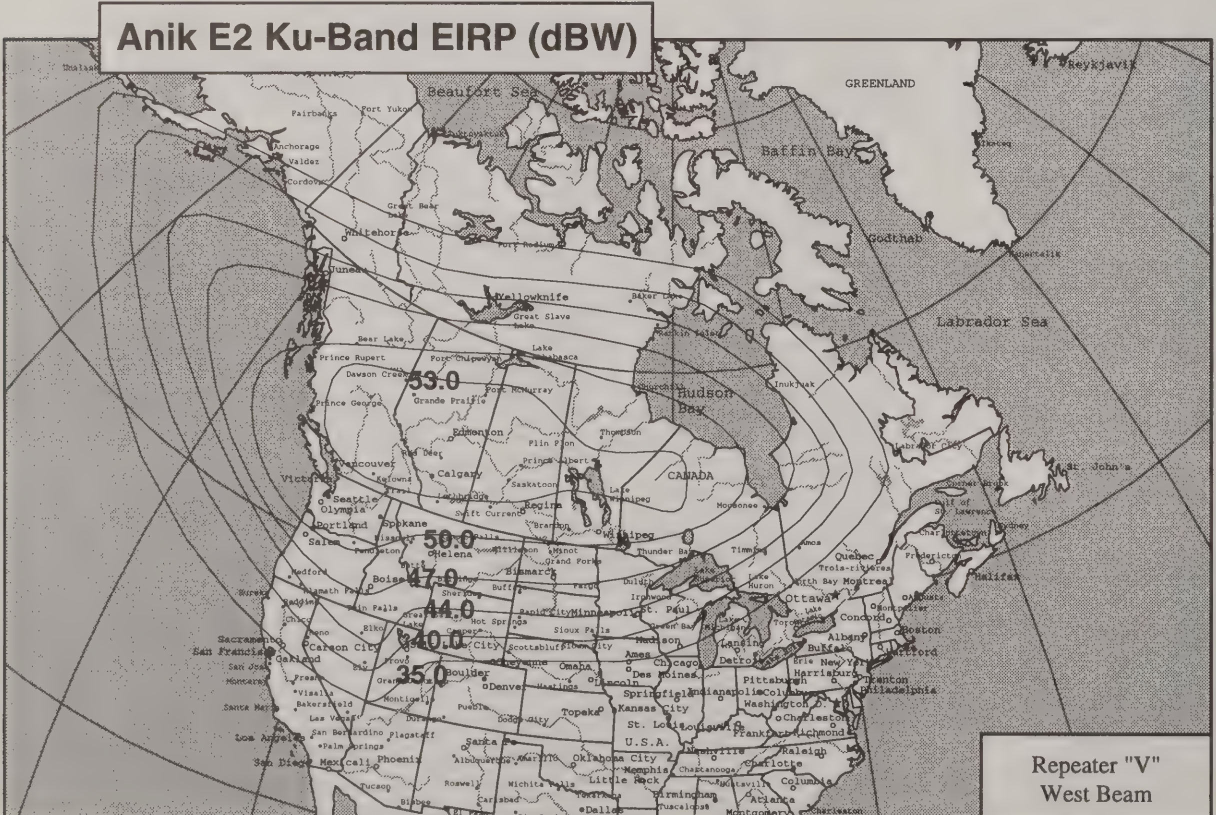
Anik E2 Ku-Band EIRP (dBW)

East beam, Horizontal polarization



Anik E2 Ku-Band EIRP (dBW)

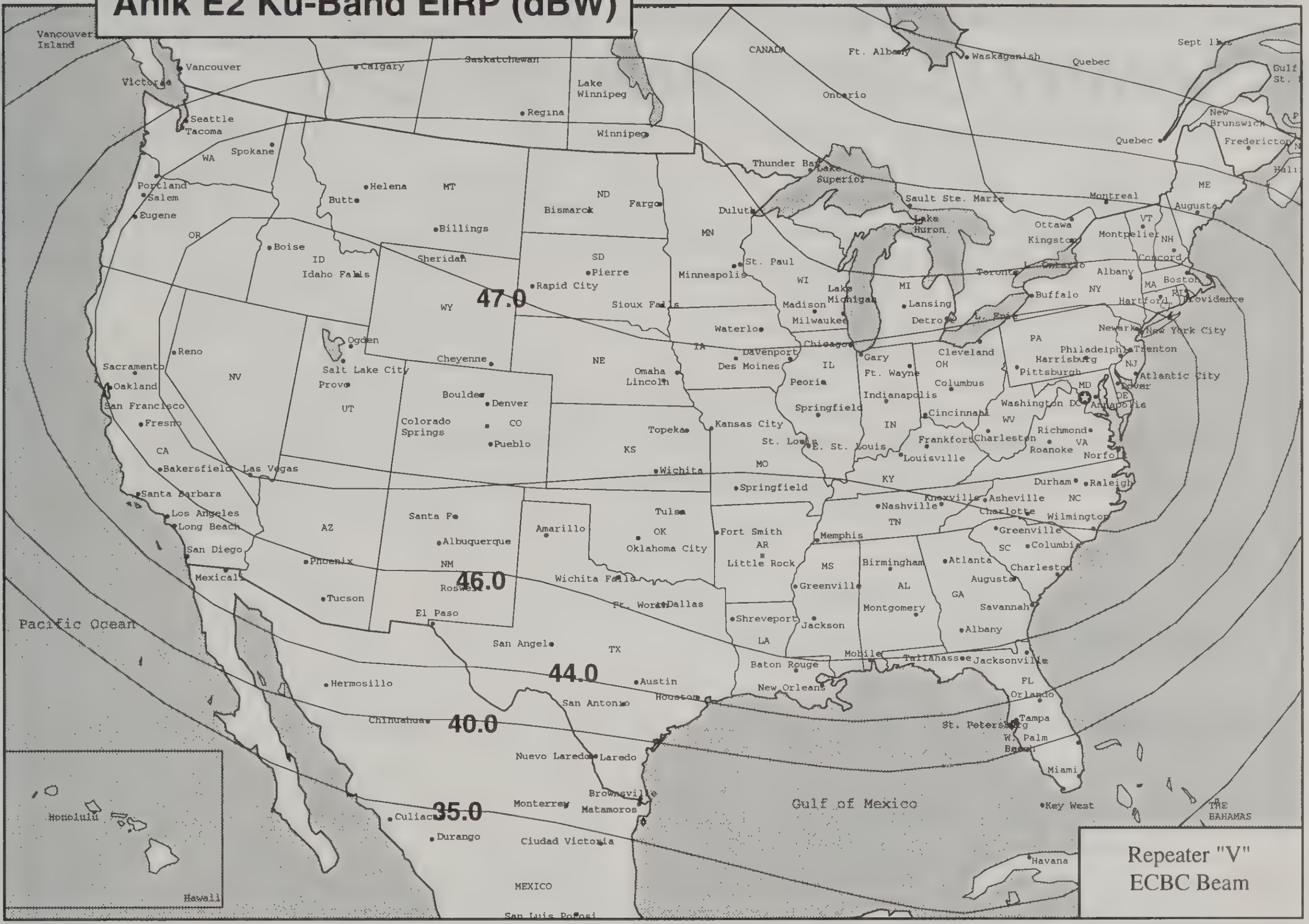
East beam, Vertical polarization



Anik E2 Ku-Band EIRP (dBW)

Repeater "V" West Beam

Anik E2 Ku-Band EIRP (dBW)



Repeater "V"
ECBC Beam

TMI COMMUNICATIONS AND COMPANY LIMITED PARTNERSHIP

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Ottawa, ON K1G 5M2
CANADA

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Facsimile:	(613)742-4100
Web Site Address:	www.msat.tmi.ca

Contacts:

Janine Buis, Manager, Marketing and Corporate Communications, e-mail: jbuis@tmi.ca
John Farrell, President and Chief Executive Officer

Booking Contact:

Diane Dekuysscher, Marketing Specialist

Public Relations Contact:

Andrea Spitzer, Media Relations

Overview:

TMI Communications is the owner and operator of the MSAT network. TMI is the only company authorized by the Candian government to own and operate a mobile communications satellite for provision of mobile satellite services in Canada. MSAT-1 transforms North and Central America, including up to 400 km offshore, Mexico and most of the Caribbean into a single communications cell.

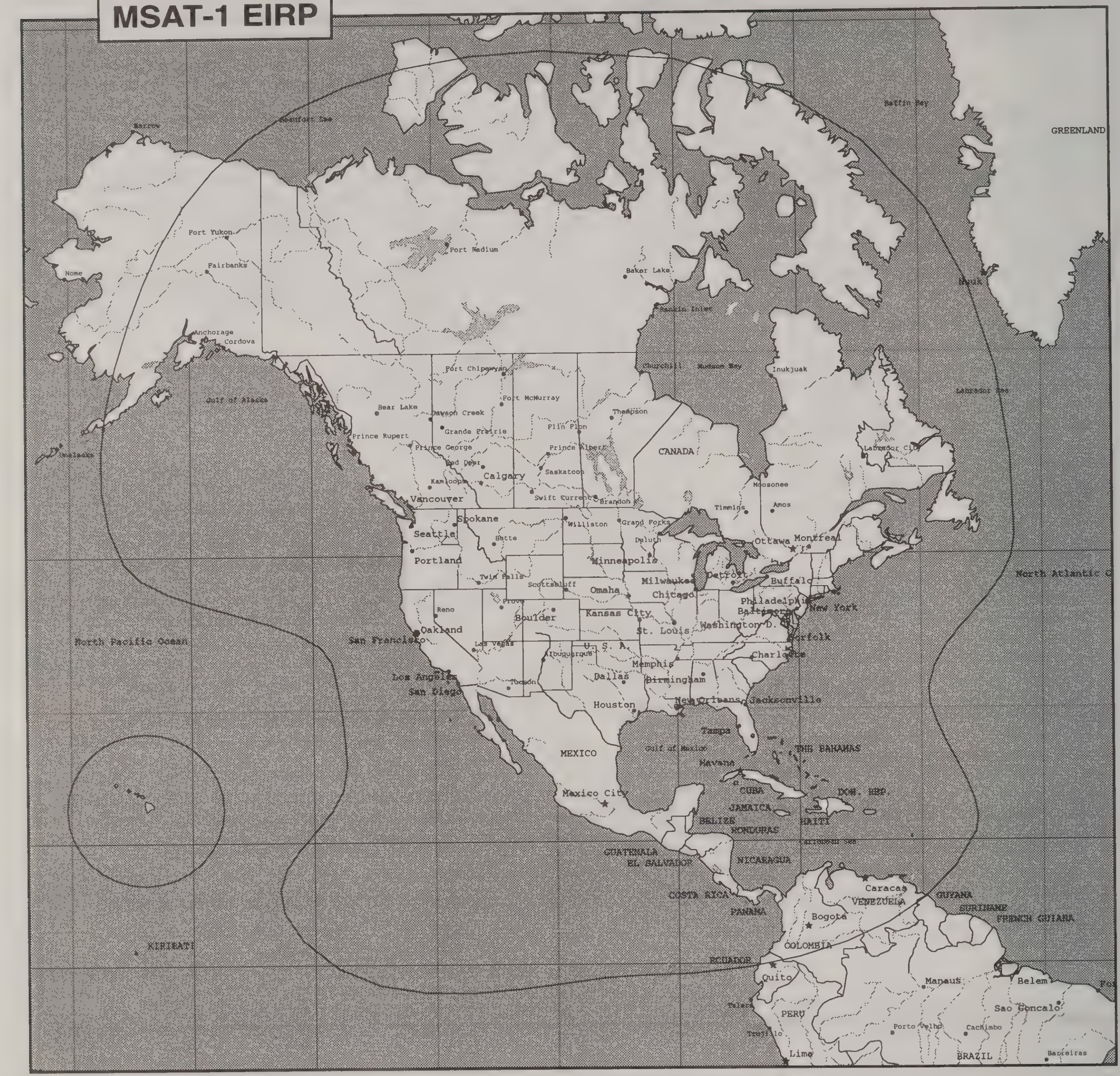
Services Offered:

- Voice
- Voice mail
- Messaging (paging)
- Aeronautical service
- Marine service
- Fax
- Data

MSAT SYSTEM At A Glance

Satellite name:	MSAT-1, 253.5°E (106.5°W)
Spacecraft data:	
Area of coverage:	North and Central America (including coastal waters to 400 km), Mexico, Hawaii, and the Caribbean
Mass (in orbit):	1,720 kg
Primary power (EOL):	3.3 kW of electrical power generated by two 3 panel solar arrays
Eclipse protection:	100%
Stabilization:	3-axis
Launch date:	April 20, 1996
Launch vehicle:	Ariane 42P
Expected lifetime:	12 years
Transponders:	
Number:	2 Ku-band to L-band forward link repeaters; 1 L-band to Ku-band return link repeater; 1 Ku-band to Ku-band repeater
Power output:	600 W by 16 SSPAs (L-band), 110 W (Ku-band)
Polarization:	Circular
Frequency bands	Mobile transmit: 1530-1559 MHz; Mobile receive: 1631.5-1660.5 MHz
Redundancy:	10:8 (L-band); 3:1 (Ku-band)
EIRP:	57.3 dBW at edge of coverage (L-band); 36.2 dBW at edge of coverage (Ku-band)
G/T:	L-band: 2.7 dB/K; Ku-band: -2.0 dB/K for 95% basic coverage area
Manufacturer:	Spar Aerospace Ltd. (communications payload); Hughes Space and Communications (bus)

MSAT-1 EIRP


Barrow
Beaufort Sea
Baffin Bay
GREENLAND
Fort Yukon
Fairbanks
Nome
Port Radium
Baker Lake
Godthab
Rankin Inlet
Anchorage
Cordova
Churchill
Hudson Bay
Inukjuak
Labrador Sea
Fort Chipewyan
Gulf of Alaska
Bear Lake
Fort McMurray
Dawson Creek
Thompson
Grande Prairie
Flin Flon
Prince Rupert
Unalaska
Prince George
Prince Albert
CANADA
Labrador City
Red Deer
Saskatoon
Kamloops
Calgary
Moosonee
Vancouver
Swift Current
Brandon
Amos
Timmins
Spokane
Williston
Grand Forks
Seattle
Butte
Duluth
Ottawa
Montreal
Portland
Minneapolis
North Atlantic O
Twin Falls
Scottsbluff
Milwaukee
Detroit
Buffalo
Omaha
Chicago
Provo
Philadelphia
Reno
Baltimore
New York
Boulder
Kansas City
Oakland
St. Louis
Washington D.C.
North Pacific Ocean
San Francisco
Norfolk
Las Vegas
U. S. A.
Albuquerque
Charlotte
Memphis
Los Angeles
Dallas
Birmingham
San Diego
Tucson
Houston
New Orleans
Jacksonville
Tampa
MEXICO
Gulf of Mexico
THE BAHAMAS
Havana
CUBA
DOM. REP.
Mexico City
JAMAICA
HAITI
BELIZE
HONDURAS
Caribbean Sea
GUATEMALA
EL SALVADOR
NICARAGUA
Caracas
COSTA RICA
VENEZUELA
GUYANA
PANAMA
SURINAME
Bogota
FRENCH GUIANA
KIRIBATI
COLOMBIA
ECUADOR
Quito
Manaus
Belem
Talara
Sao Goncalo
PERU
Porto Velho
Cachimbo
Trujillo
Lima
BRAZIL
Barreiras

MINISTRY OF POSTS AND TELECOMMUNICATIONS (CHINA)

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Beijing 100804
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Telex:	222185

Booking Contact:

Zhang Ligui, Director General of Telecommunications

Public Relations Contact:

Zhao Xintong, Director, Department of External Affairs

Overview:

Operates the ChinaSat satellite system.

Services Offered:

- Six color television channels
- Telex, fax, telephone, and telemetry

Satellite Control Network:

Satellite control:	Xian
TT&C stations:	Xian

CHINASAT-1 (DFH-2A) SYSTEM At A Glance

Satellite name: ChinaSat-1 (DFH-2A), 110.5°E
Spacecraft data:
- Mass (in orbit): 1,024 kg
- Stabilization: Spin
- Launch date: February 1990
- Expected lifetime: 7 years

Transponders:
- Number: 4
- Power output: 10 W
- Uplink frequency: 5.925-6.425 GHz
- Downlink frequency: 3.700-4.200 GHz
- Polarization: Linear
- Bandwidth: 50 MHz
- Antenna beam: Zone

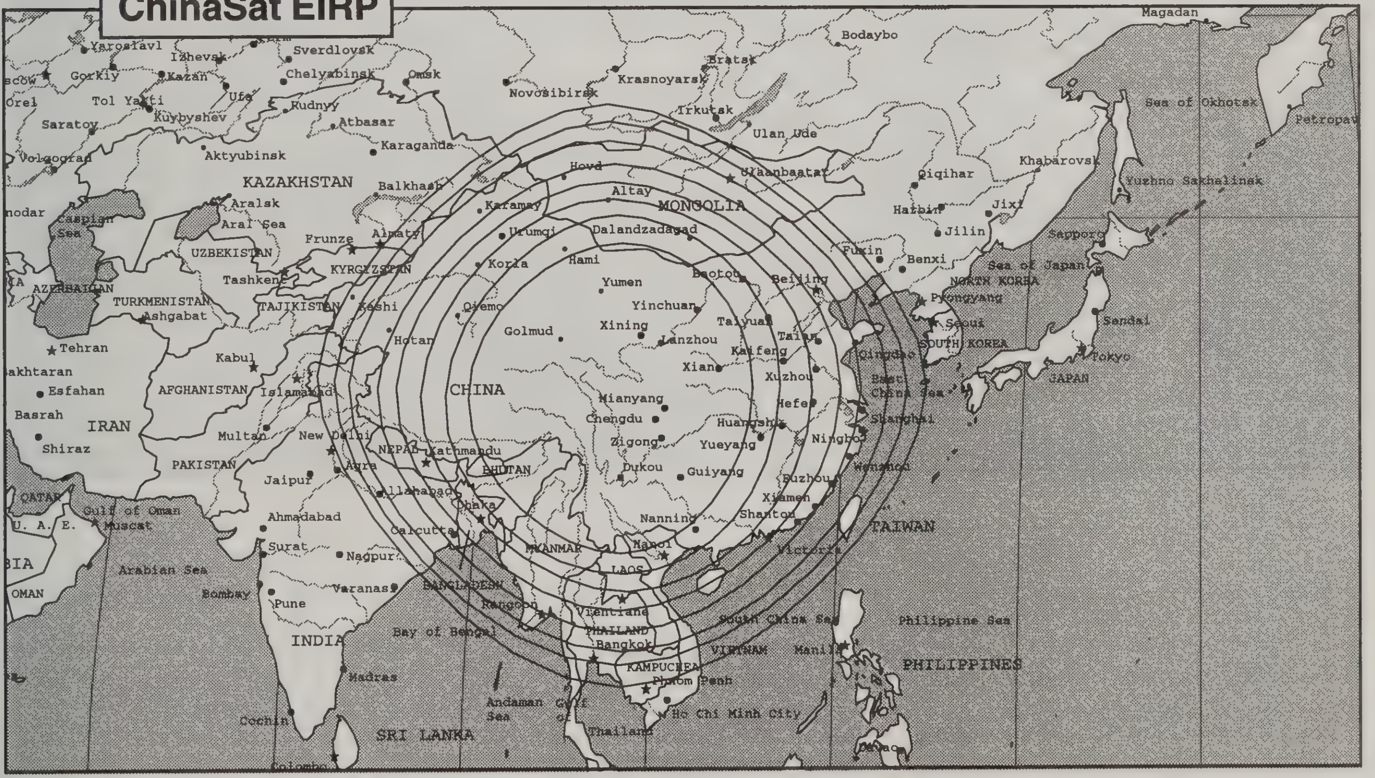
ChinaSat-1

Orbital location:	110.5ºE
Launch:	February 1990
Expected lifetime:	7 years
Expected end of life:	1996

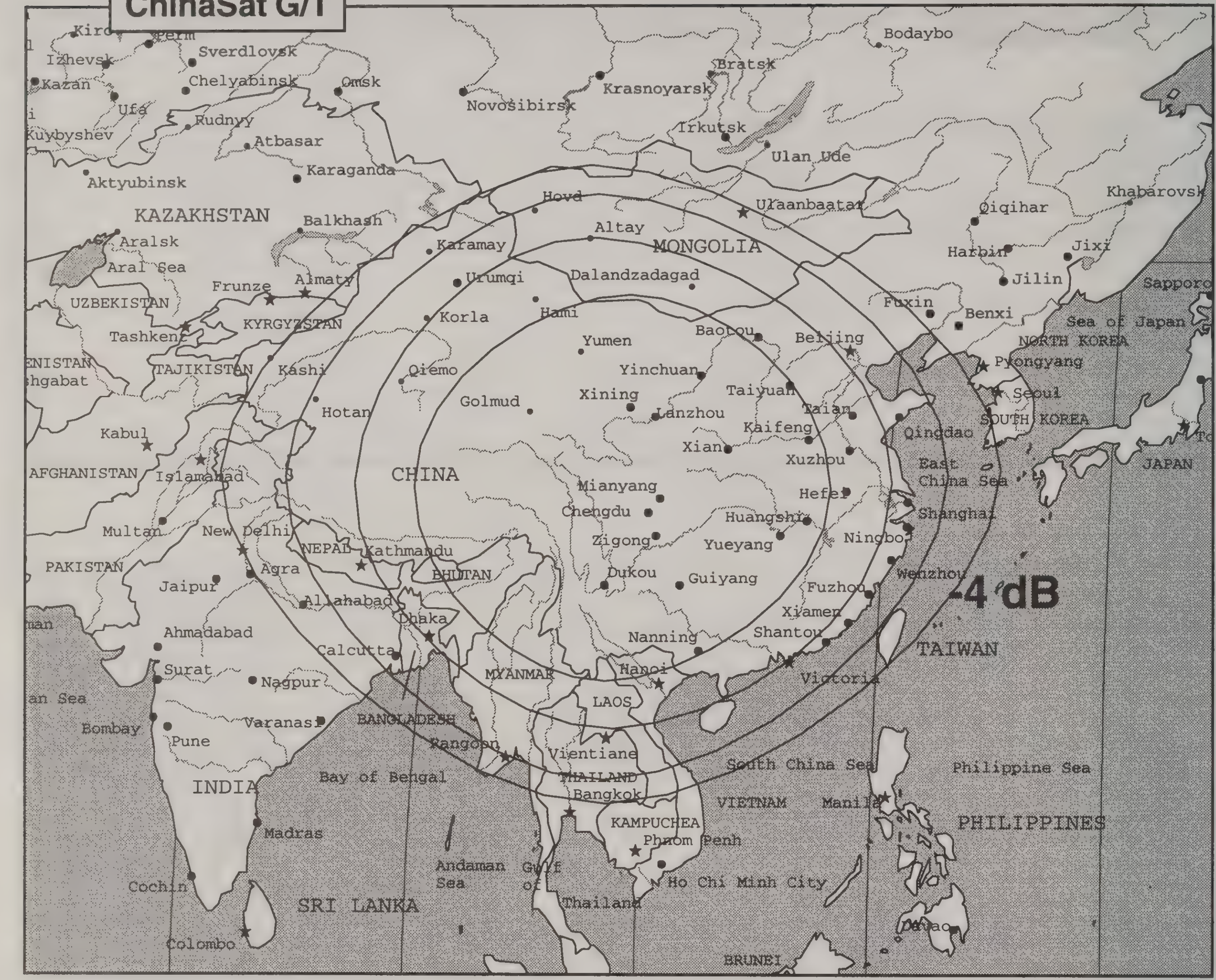
Antennas beam coverage overview:

C-band, zone beam:	China

ChinaSat EIRP



ChinaSat G/T


-4 dB
KAZAKHSTAN
MONGOLIA
CHINA
UZBEKISTAN
KYRGYZSTAN
TAJIKISTAN
AFGHANISTAN
PAKISTAN
INDIA
NEPAL
BHUTAN
BANGLADESH
MYANMAR
LAOS
THAILAND
KAMPUCHEA
VIETNAM
SRI LANKA
BRUNEI
PHILIPPINES
TAIWAN
NORTH KOREA
SOUTH KOREA
JAPAN
Sea of Japan
East China Sea
South China Sea
Philippine Sea
Bay of Bengal
Andaman Sea
Gulf of Thailand
Aral Sea
Kirov
Perm
Izhevsk
Sverdlovsk
Kazan
Chelyabinsk
Omsk
Novosibirsk
Krasnoyarsk
Bratsk
Bodaybo
Irkutsk
Ulan Ude
Ufa
Rudnyy
Kuybyshev
Atbasar
Karaganda
Aktyubinsk
Balkhash
Aralsk
Frunze
Almaty
Tashkent
Kashi
Hotan
Kabul
Islamabad
Multan
New Delhi
Agra
Jaipur
Allahabad
Ahmadabad
Surat
Nagpur
Bombay
Pune
Varanasi
Calcutta
Dhaka
Kathmandu
Madras
Cochin
Colombo
Hovd
Altay
Karamay
Urumqi
Korla
Hami
Qiemo
Golmud
Dalandzadagad
Ulaanbaatar
Yumen
Yinchuan
Baotou
Beijing
Xining
Lanzhou
Taiyuan
Taian
Kaifeng
Xian
Xuzhou
Mianyang
Chengdu
Hefei
Huangshi
Zigong
Yueyang
Ningbo
Shanghai
Dukou
Guiyang
Fuzhou
Wenzhou
Xiamen
Shantou
Nanning
Hanoi
Victoria
Vientiane
Rangoon
Bangkok
Phnom Penh
Ho Chi Minh City
Manila
Davao
Qiqihar
Harbin
Khabarovsk
Jixi
Jilin
Fuxin
Benxi
Sapporo
Pyongyang
Seoul
Qingdao

CHINASAT-7 SYSTEM At A Glance

Satellite name: ChinaSat-7*, 115.5°E

Spacecraft data:
- Launch date: August 18, 1996
- Transponders:
  - Number: 18 C-band; 6 Ku-band
  - Power output: 16 W TWTA for wideband; 8.5 W TWTA for narrowband
- Manufacturer: Lockheed Martin

*Lost following a third-stage launcher failure

ChinaSat-7 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1[1]	H	36	5.945	3.720
2[3]	H	36	5.985	3.760
3[5]	H	36	6.025	3.800
4[7]	H	36	6.065	3.840
5[9]	H	36	6.105	3.880
6[11]	H	36	6.145	3.920
7[13]	H	36	6.185	3.960
8[15]	H	36	6.225	4.000
9[17]	H	36	6.265	4.040
10[19]	H	36	6.305	4.080
11[21]	H	36	6.345	4.120
12[23]	H	36	6.385	4.160
13	V	72	5.985	3.760
14	V	72	6.065	3.840
15	V	72	6.145	3.920
16	V	72	6.245	4.020
17	V	72	6.305	4.080
18	V	72	6.385	4.160
19	H	72	14.040	11.740
20	H	72	14.120	11.820
21	H	72	14.200	11.900
22	H	72	14.280	11.980
23	H	72	14.360	12.060
24	H	72	14.440	12.140

CHINASAT-8 SYSTEM At A Glance

Satellite name: ChinaSat-8 (TBA) [to be launched]

Spacecraft data:
- Launch date: Late 1998
- Transponders:
  - Number: 36 C-band; 16 Ku-band
- Manufacturer: Space Systems/Loral

DFH-3 SYSTEM At A Glance

Satellite name: DFH-3, 87.5°E, 125°E, 110.5°E*
DFH-3A, 87.5°E

Spacecraft data:
- Mass (in orbit): 1,155 kg
- Stabilization: 3-axis
- Launch date: November 30, 1994 (3); Late 1996 (3A)
- Expected lifetime: 8 years
- Transponders:
  - Number and power output: 18 @ 8 W SSPA, 6 @ 16 W TWTA
  - EIRP: 34.5 dBW (8 W SSPA), 37.4 dBW (16 W TWTA)

* Lost in launch

FRANCE TELECOM

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FRANCE

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Facsimile:	+33 1-46-57-95-11

Booking Contact:

France Telecom SERTE, 67 rue des Archives, F-75003 Paris, France, 1-44-61-47-00

Public Relations Contact:

Kimberly Steiner, France Telecom Inc., 1270 Avenue of the Americas, New York, NY 10020, USA, (212)977-8630

Overview:

Operates Telecom, a national telecommunications satellite system. Provides telecommunications and television/radio transmission services between France and its overseas departments, as well as between France and other European countries.

Services Offered:

- Communications services between France and its overseas departments
- Digital business services including data transmission at up to 2 Mbps
- Transmits and distributes radio and television broadcasts to broadcast transmitters, cable networks and individual satellite dishes

Satellite Control Network:

Satellite control:	Mulhouse, France
TT&C stations:	Rambouillet; Aussaguel-Issus

TELECOM 1 SYSTEM At A Glance

Satellite name: Telecom 1C, 3°E

Spacecraft data:

- Mass (in orbit, BOL): 684 kg
- Primary power (EOL): 1045 W
- Eclipse protection: All transponders
- Stabilization: 3-axis
- Launch date: March 11, 1988
- Launch vehicle: Ariane 3
- Expected lifetime: 7 years (still operational)

Transponders:

- Number: 12 (4 C-band, 6 Ku-band, 2 X-band military*)
- Power output: 20 W TWTA (Ku-band), 8.5 W TWTA (C-band)
- Polarization: Vertical (Ku-band), Circular (C-band)
- Redundancy: 2 backups (C-band), 3 backups (Ku-band)

Single carrier saturation flux density: -91 dBW/sq.m (Ku-band), -70 dBW/sq.m. (C-band)

Manufacturer: Matra and Alcatel Espace

* Data not given

Telecom 1 Transponder Frequency Plan

Tr.#	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
F1	40	26.5*	5.945	3.720
F2	120	26.5*	6.040	3.775
F3	40	26.5*	6.135	3.910
F4	120	26.5*	6.360	4.135
R1	36	49	14.022	12.522
R2	36	49	14.064	12.564
R3	36	49	14.106	12.606
R4	36	49	14.148	12.648
R5	36	49	14.190	12.690
R6	36	49	14.232	12.732

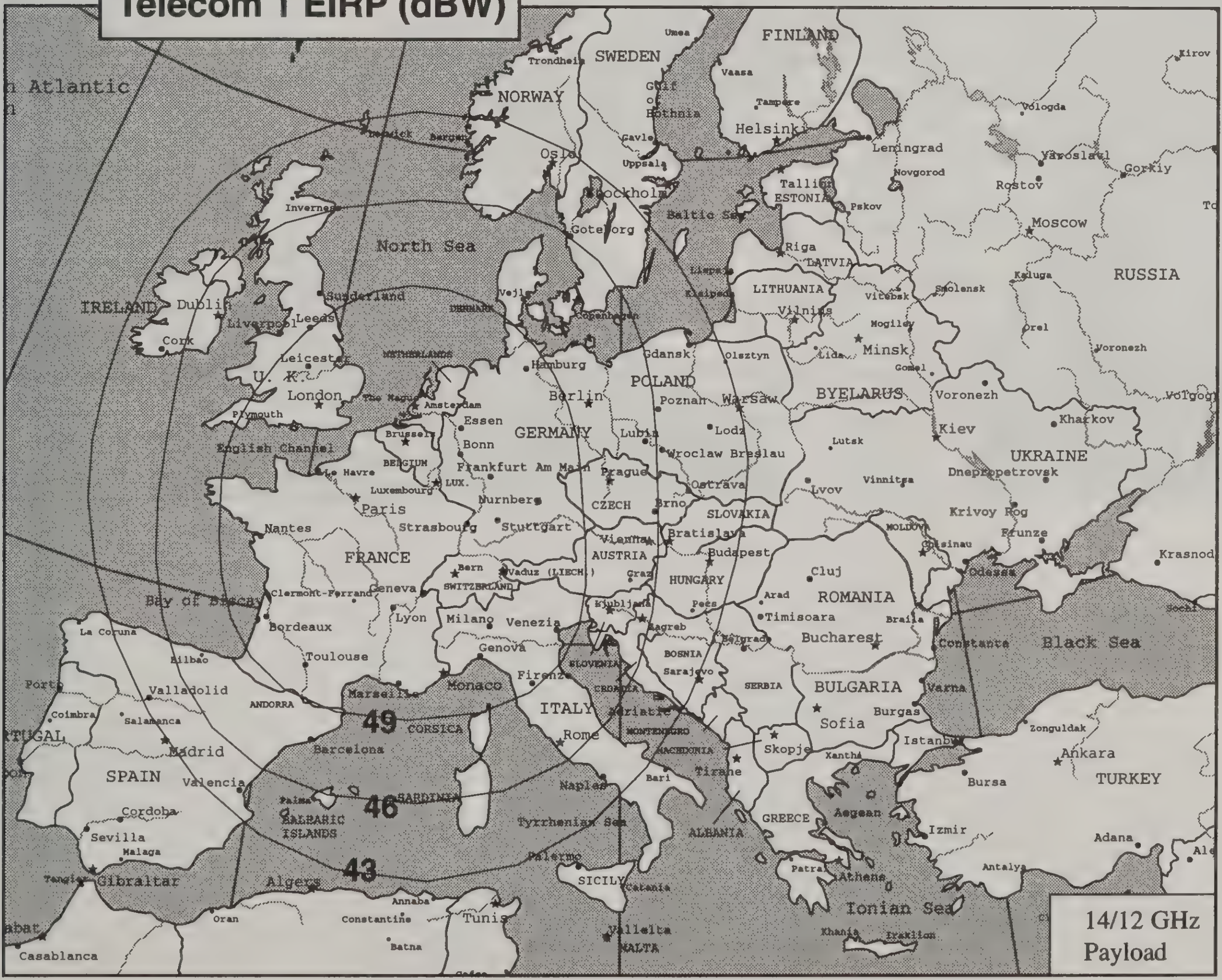
* Hemispheric; Spotbeam: 35.5 dBW

Telecom 1C

Orbital location:	3°E
Launch:	March 11, 1988, Ariane 3
Expected lifetime:	7 years
Expected end of life:	1995 (still operational)

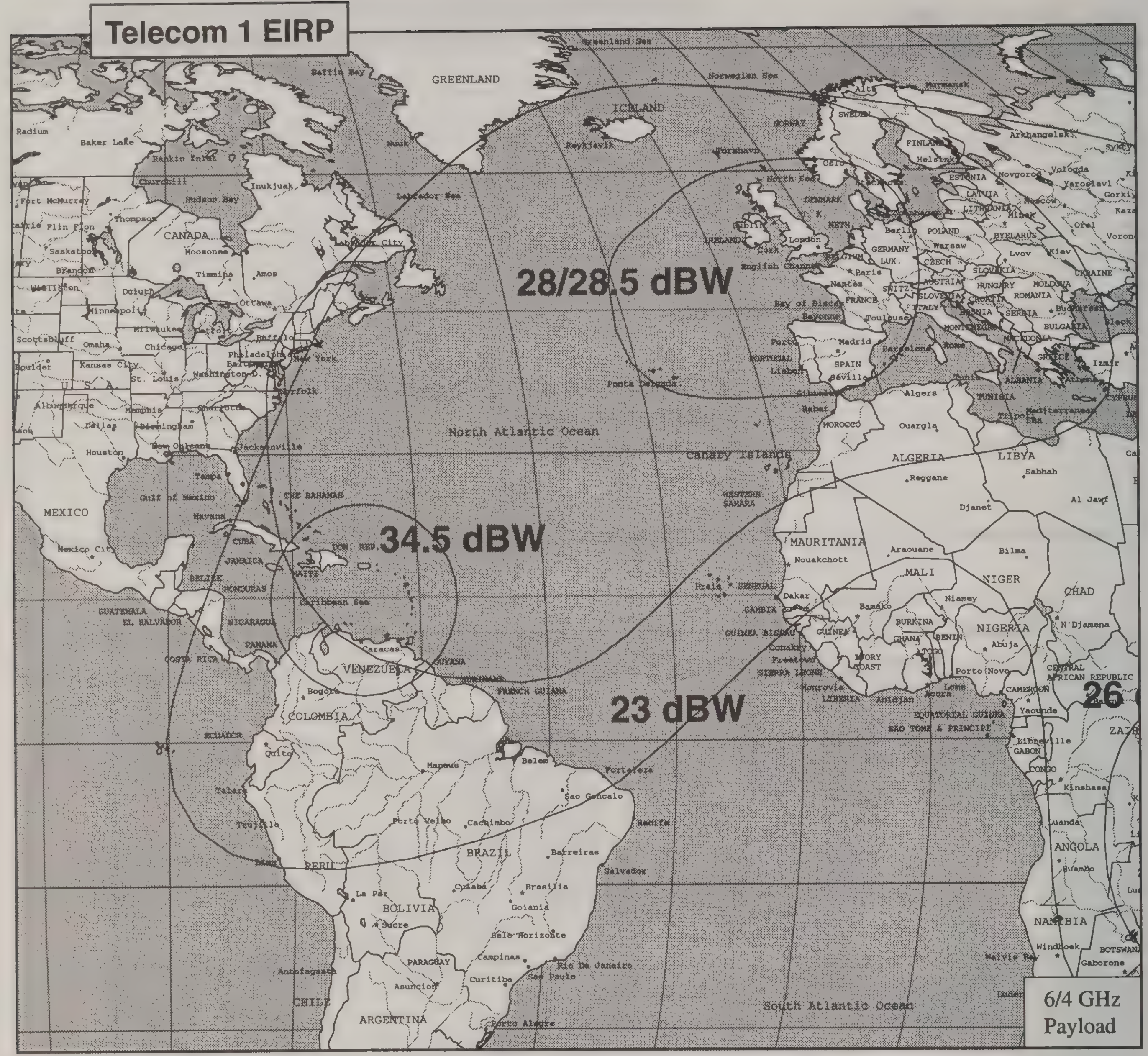
Antennas beam coverage overview:

C-band:	French mainland and overseas territories; Caribbean spot beam
Ku-band:	French mainland



Telecom 1 EIRP (dBW)

14/12 GHz Payload


Telecom 1 EIRP
28/28.5 dBW
34.5 dBW
23 dBW
26
6/4 GHz Payload
GREENLAND
ICELAND
CANADA
U S A
MEXICO
North Atlantic Ocean
South Atlantic Ocean
BRAZIL
VENEZUELA
COLOMBIA
ALGERIA
LIBYA
MAURITANIA
MALI
NIGER
NIGERIA
ANGOLA

TELECOM 2 SYSTEM At A Glance

Satellite name:	Telecom 2A, 352°E (8°W); Telecom 2B, 355°E (5°W); Telecom 2C, 3°E Telecom 2D, 355°E (5°W)
Spacecraft data:	
Mass (in orbit):	1380 kg
Primary power (EOL):	3770 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	December 16, 1991 (Telecom 2A), April 15, 1992 (Telecom 2B), December 6, 1995 (Telecom 2C), August 8, 1996 (Telecom 2D)
Launch vehicle:	Ariane 4
Expected lifetime:	10 years
Transponders:	
Number:	10 (C-band), 11 (Ku-band), 5 (X-band military)
Power output:	8.5 W SSPA (C-band), 55 WTWTA (Ku-band)
Polarization:	Circular (C-band), Vertical (Ku-band)
Redundancy:	6:4, 8:6 (C-band), 15:11 (Ku-band)
Manufacturer:	Matra and Alcatel Espace

Telecom 2 Transponder Frequency Plan

C-band

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
C1	LHCP	50	32.5*	5.950	3.725
C2	LHCP	50	32.5*	6.008	3.783
C3	LHCP	50	32.5*	6.074	3.849
C4	LHCP	50	32.5*	6.132	3.907
C5A	LHCP	50	39.0	6.190	3.965
C5B	RHCP	50	39.0/42.46	6.190	3.965
C6A	LHCP	92	42.4	6.274	4.049
C6B	RHCP	92	39.0	6.274	4.049
C7A	LHCP	92	39.0	6.379	4.154
C7B	RHCP	92	42.4	6.379	4.154

* Hemispheric

Ku-band

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
R1	H	36	52.5	14.022	12.522
R2	H	36	52.5	14.064	12.564
R3	H	36	52.5	14.106	12.606
R4	H	36	52.5	14.148	12.648
R5	H	36	52.5	14.190	12.690
R6	H	36	52.5	14.232	12.732
R7	V	36	52.5	14.043	12.543
R8	V	36	52.5	14.085	12.585
R9	V	36	52.5	14.127	12.627
R10	V	36	52.5	14.169	12.669
R11	V	36	52.5	14.211	12.711

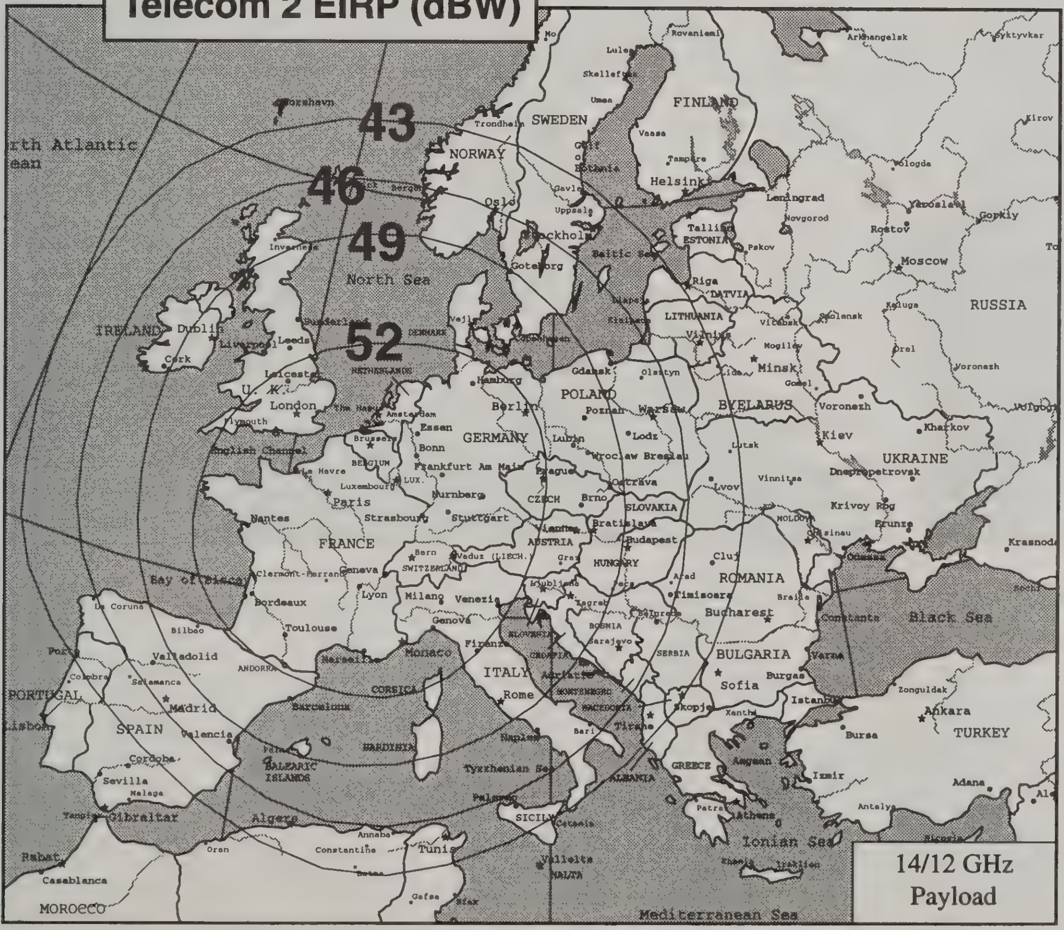
Telecom 2A, Telecom 2B, Telecom 2C, Telecom 2D

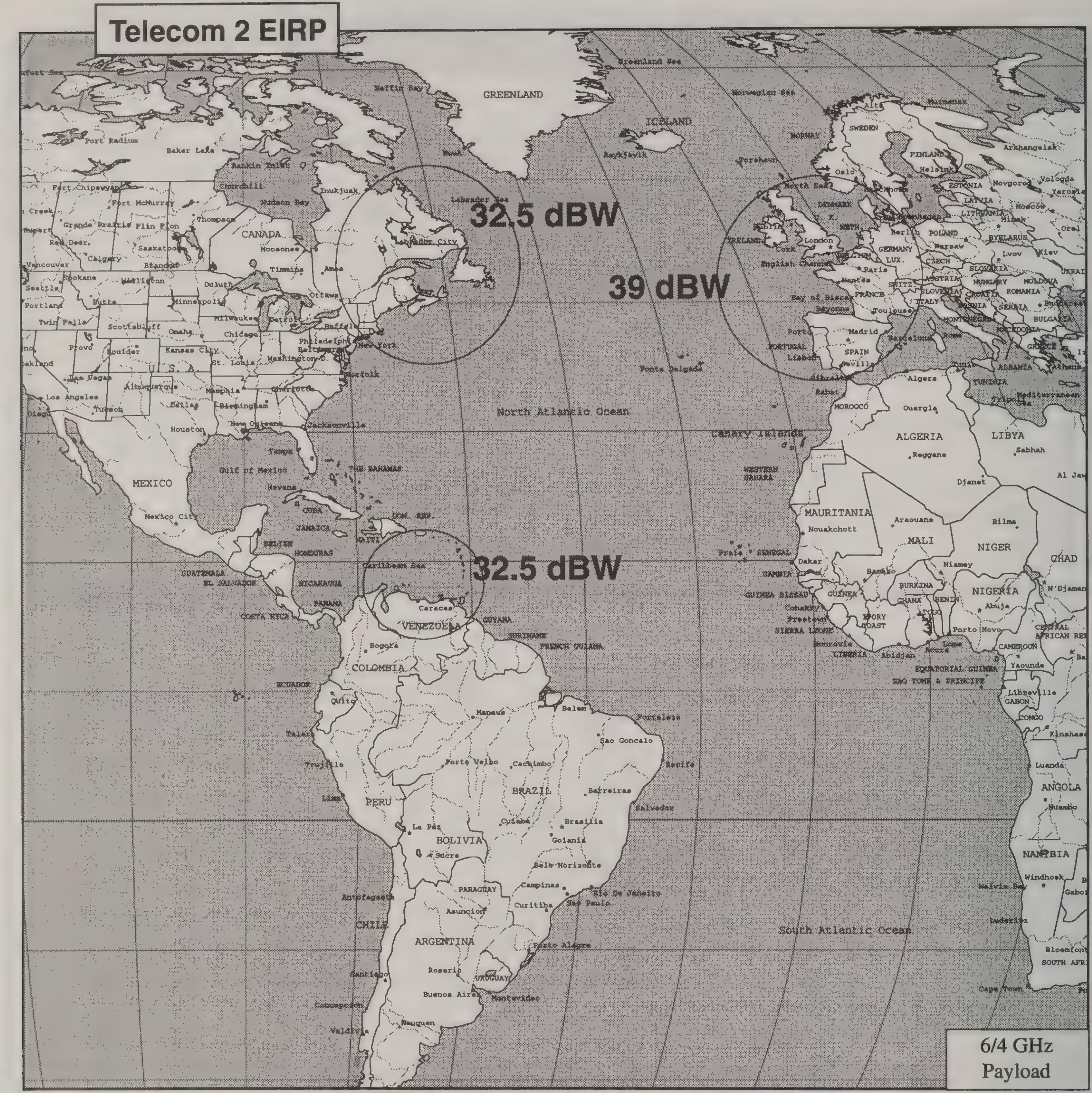
Orbital location:	352°E (8°W) [2A]; 355°E (5°W) [2B], 3°E (2C), 355°E (5°W) [2D]
Launch:	December 16, 1991, Ariane 4 (2A); April 15, 1992, Ariane 4 (2B); December 6, 1995, Ariane 4 (2C); August 8, 1996, Ariane 4 (2D)
Expected lifetime:	10 years
Expected end of life:	2001 (2A), 2002 (2B), 2005 (2C), 2006 (2D)

Antennas beam coverage overview:

C-band:	French mainland and overseas territories
Ku-band:	France and adjacent areas

Telecom 2 EIRP (dBW)




Telecom 2 EIRP
32.5 dBW
39 dBW
32.5 dBW
6/4 GHz
Payload
GREENLAND
ICELAND
CANADA
U.S.A.
MEXICO
North Atlantic Ocean
South Atlantic Ocean
VENEZUELA
COLOMBIA
BRAZIL
PERU
BOLIVIA
PARAGUAY
ARGENTINA
CHILE
URUGUAY
ALGERIA
LIBYA
MAURITANIA
MALI
NIGER
NIGERIA
CHAD
ANGOLA
NAMIBIA
FRANCE
SPAIN
PORTUGAL
GERMANY
POLAND
SWEDEN
FINLAND

TELEFUSION DE FRANCE (TDF)

21-27 rue Barbes		Telephone:	+33 1-49-65-10-00
F-92120 Montrouge		Telex:	250738
FRANCE			

Booking Contact:

Alain Baget, Department Director

Public Relations Contact:

Thierry Bernard, Head of Public Relations

Overview:

Operates the TDF direct broadcast satellite system, providing television and radio communications to France with four TV channels and four radio channels.

Service Offered:

- Direct broadcast satellite services, including television and radio.

Satellite Control Network:

Satellite control:	Toulouse, France
TT&C stations:	Toulouse, France

TDF SYSTEM At A Glance

Satellite name:	TDF1, 341°E (19°W); TDF2, 341°E (19°W)
Spacecraft data:	
Mass (in orbit, BOL):	1,318 kg (TDF1), 1,255 kg (TDF2)
Primary power (EOL):	3,300 W
Eclipse protection:	None
Stabilization:	3-axis
Launch date:	October 28, 1988 (TDF1), July 24, 1990 (TDF2)
Launch vehicel:	Ariane 2 (TDF1), Ariane 4 (TDF2)
Expected lifetime:	7-9 years
Transponders:	
Number:	6
Power output:	230 W TWTA (3 transponders) (TDF1), 260 W TWTA (3 transponders) (TDF2)
Polarization:	RHCP
Redundancy:	1 backup (for channel 9 only)
Manufacturer:	Eurosatellite

TDF Transponder Frequency Plan

Tr.#	BW(MHz)	EIRP(dBW)	Downlink(GHz)
1	27	63.8	11.72748
5	27	63.8	11.80420
9	27	63.9	11.88092
13	27	64	11.95764
17	27	64	12.03436

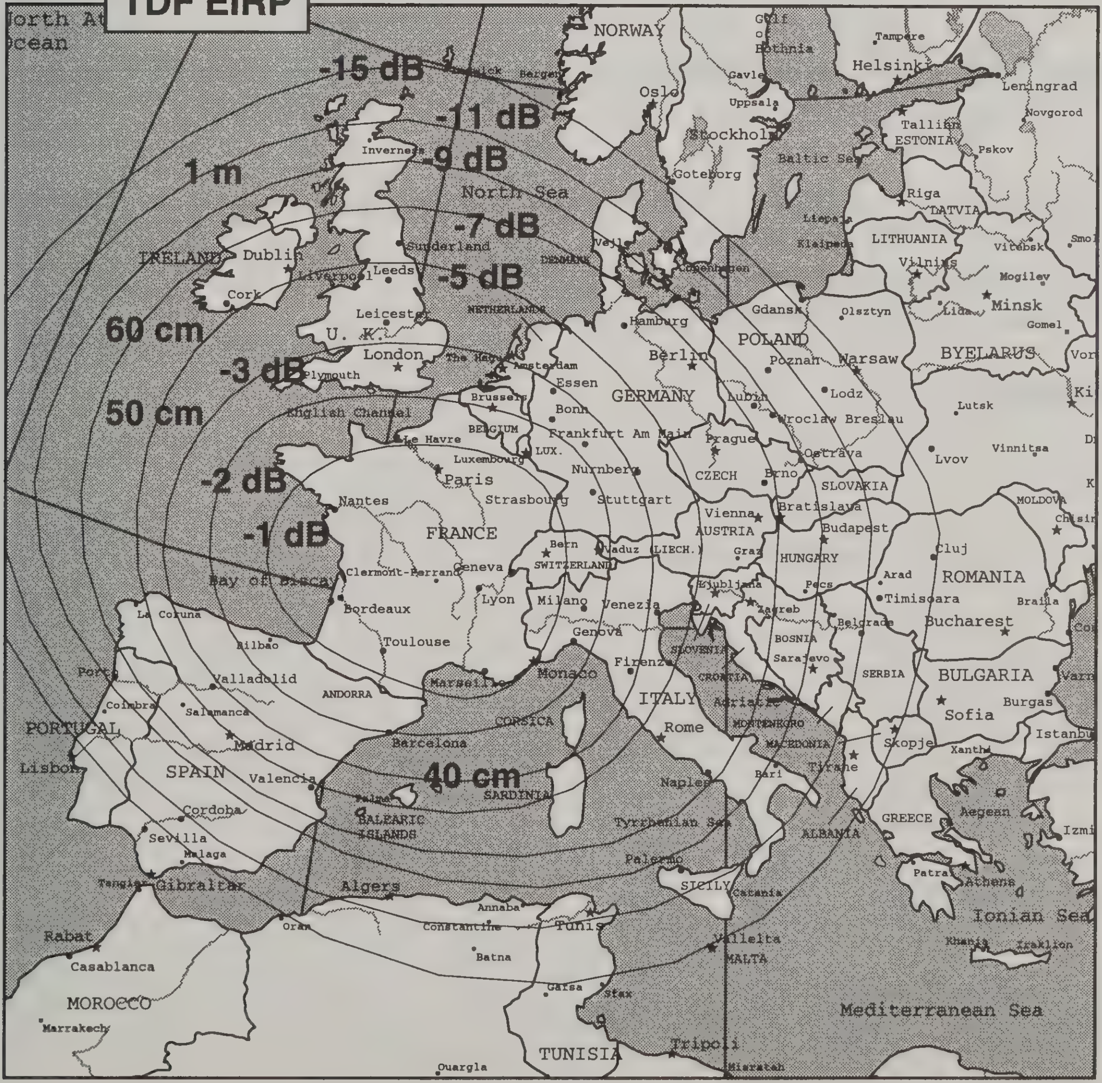
TDF1 and TDF2

Orbital location: 341°E (19°W), collocated
Launch: October 28, 1988, Ariane 2 (TDF1); July 24, 1990, Ariane 4 (TDF2)
Expected lifetime: 7 to 9 years
Expected end of life: 1996 (TDF1), 1997 - 1998 (TDF2)

Antennas beam coverage overview:

DBS: France and adjacent countries

TDF EIRP



DEUTSCHE TELEKOM AG

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Corporate E-mail:	info@nic.dtag.de

Booking Contact:

Mr. Bocking

Contact:

Axel Jörns, Director of Satellite Systems

Overview:

Deutsche Telekom AG operates two domestic satellite systems: DFS-Kopernikus and TV-SAT 2.

Services Offered:

- Transmission of TV and radio programs
- Telephony and data transmission
- Direct broadcast satellite (DBS) services

Satellite Control Network:

Satellite control:	Telecom SCC Usingen
TT&C stations:	Usingen, Weilheim

DFS-KOPERNIKUS SYSTEM At A Glance

Satellite name:	DFS1-Kopernikus (FM3), 23.5°E; DFS2-Kopernikus (FM2), 28.5°E
Spacecraft data:	
Mass (in orbit):	820 kg
Primary power (EOL):	1,500 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	October 1992 (DFS1); July 1990 (DFS2)
Launch vehicle:	Delta II (DFS1); Ariane 44L (DFS2)
Expected lifetime:	12.5 years
Transponders:	
Number:	10 Ku-band, 1 Ka-band
Power output:	20 W TWTA
Polarization:	Linear (Ka-band), dual linear (Ku-band)
Redundancy:	6 backups
Uplink G/T:	74.4 dB/K (Ku-band)
Manufacturer:	R-DFS Consortium

DFS-Kopernikus Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)*	Uplink (GHz)	Downlink(GHz)
A	V	90	53.7	14.300	11.5000
B	H	90	53.7	14.375	11.5750
C	V	90	53.7	14.450	11.6600
1	V	44	54.2	---	12.6246
1	H	44	---	29.500	---
2	V	44	---	14.024	---
2	H	44	54.2	---	12.558
3	V	44	54.2	---	12.591
3	H	44	---	14.091	---
4	V	44	---	14.125	---
4	H	44	54.2	---	12.625
5	V	44	54.2	---	12.658
5	H	44	---	14.158	---
6	V	44	---	14.192	---
6	H	44	54.2	---	12.682
7	V	44	54.2	---	12.725
7	H	44	---	14.225	---
I	V	90	---	28.500	---
I	H	90	52.2	---	19.700

* At beam center

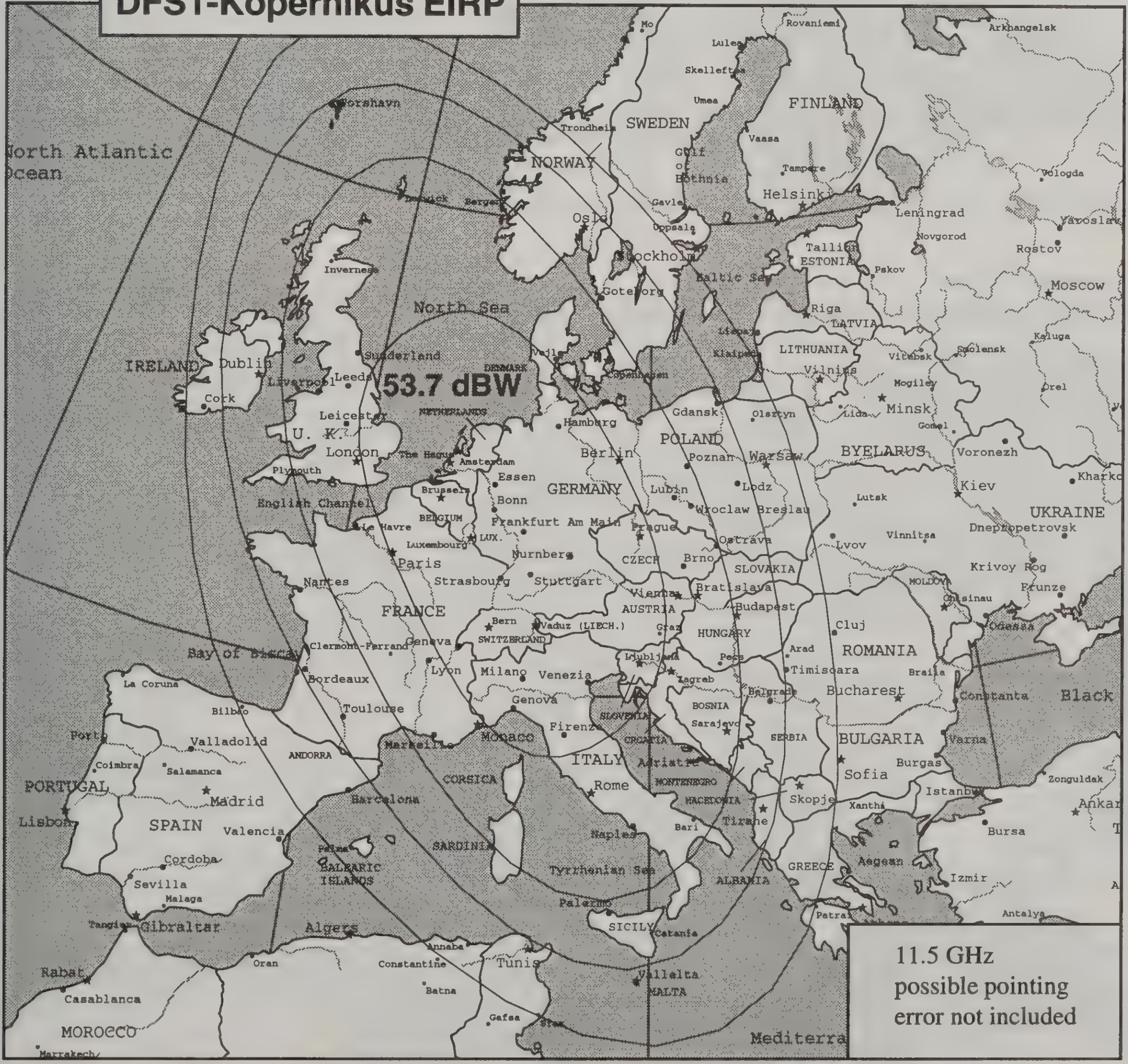
DFS-Kopernikus

Orbital location:	23.5°E (DFS1 [FM3]); 28.5°E (DFS2 [FM2])
Launch:	October 1992 (DFS1 [FM3]), Delta II; July 1990 (DFS2 [FM2]), Ariane 44L
Expected lifetime:	12.5 years
Expected end of life:	2005 (DFS1 [FM3]), 2004 (DFS2 [FM2])

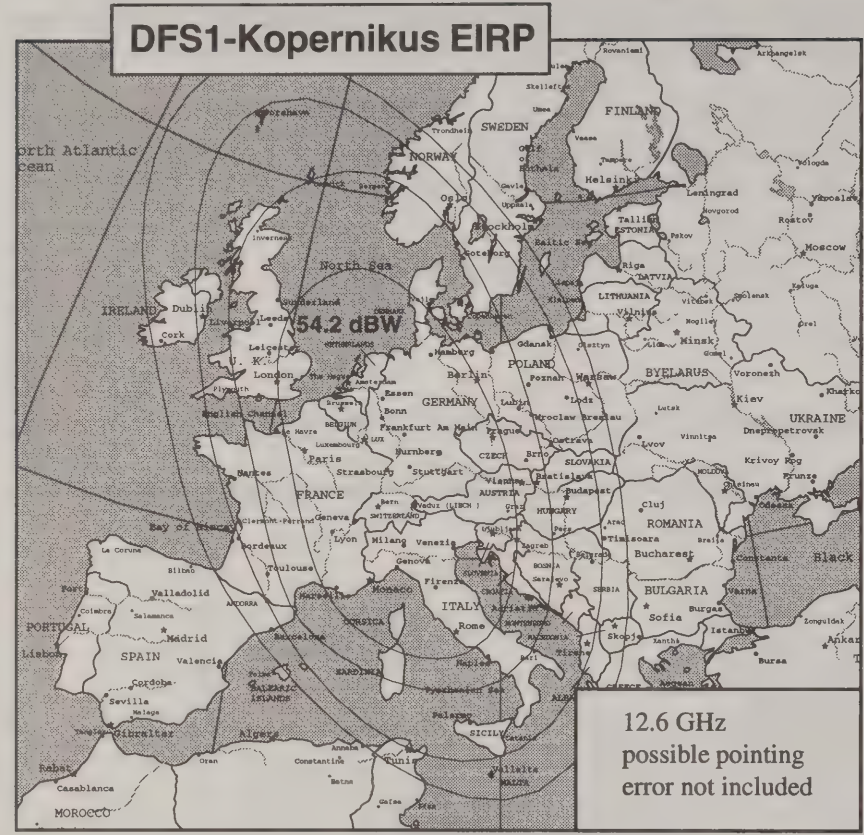
Antennas beam coverage overview:

Ku-band, Ka-band:	Germany and Central/East European countries

DFS1-Kopernikus EIRP

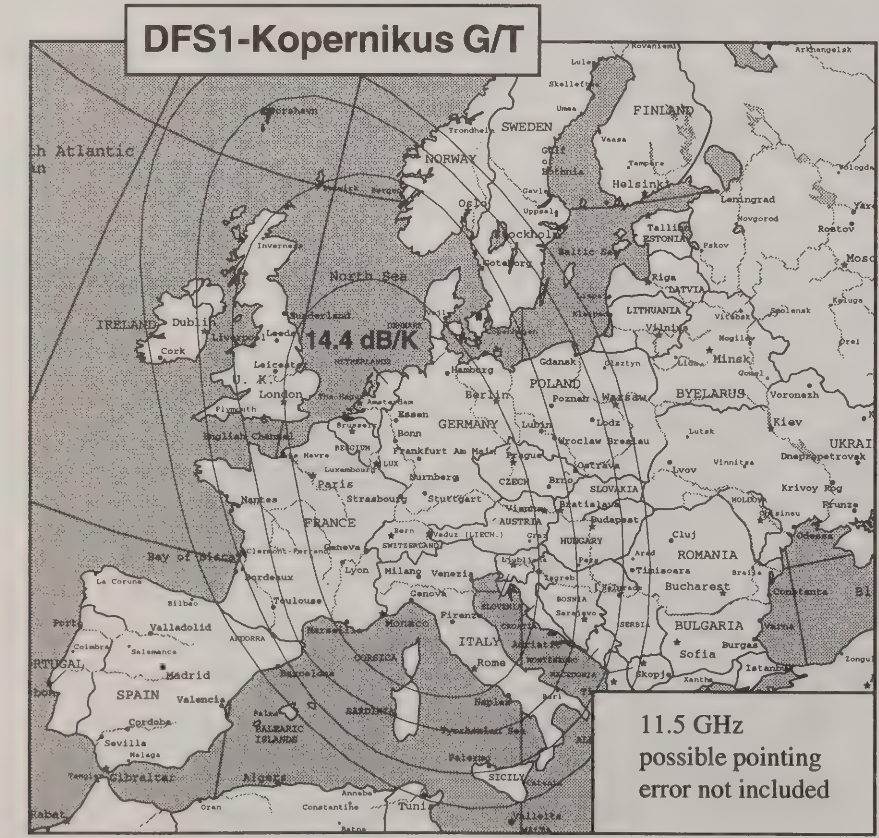


11.5 GHz
possible pointing
error not included



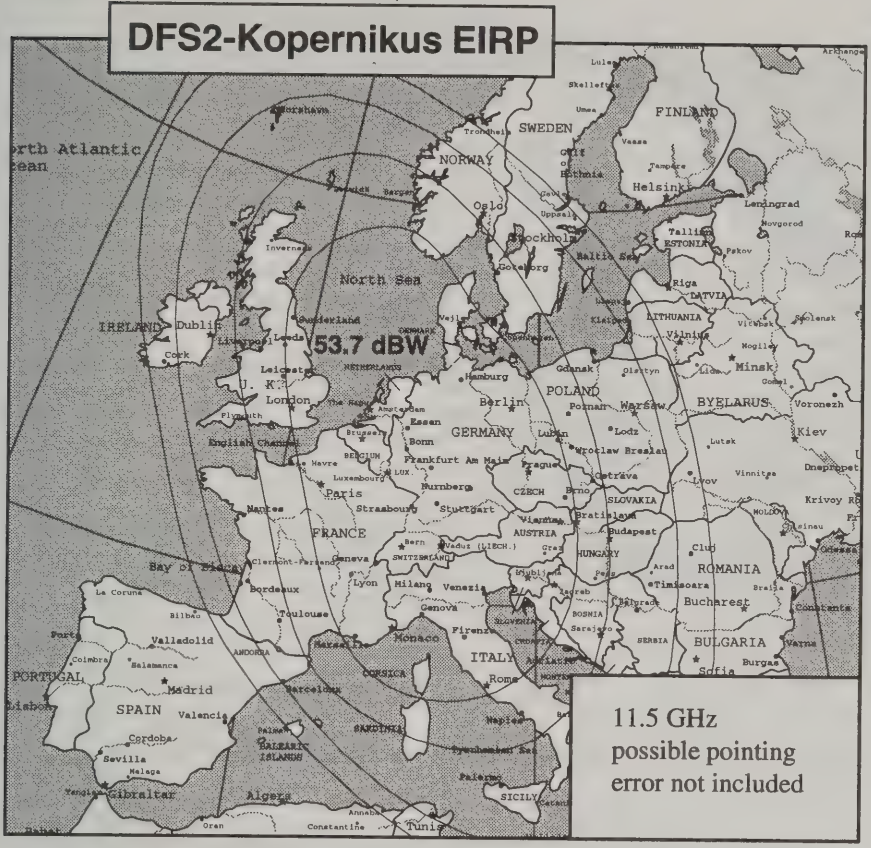
DFS1-Kopernikus EIRP

12.6 GHz
possible pointing
error not included

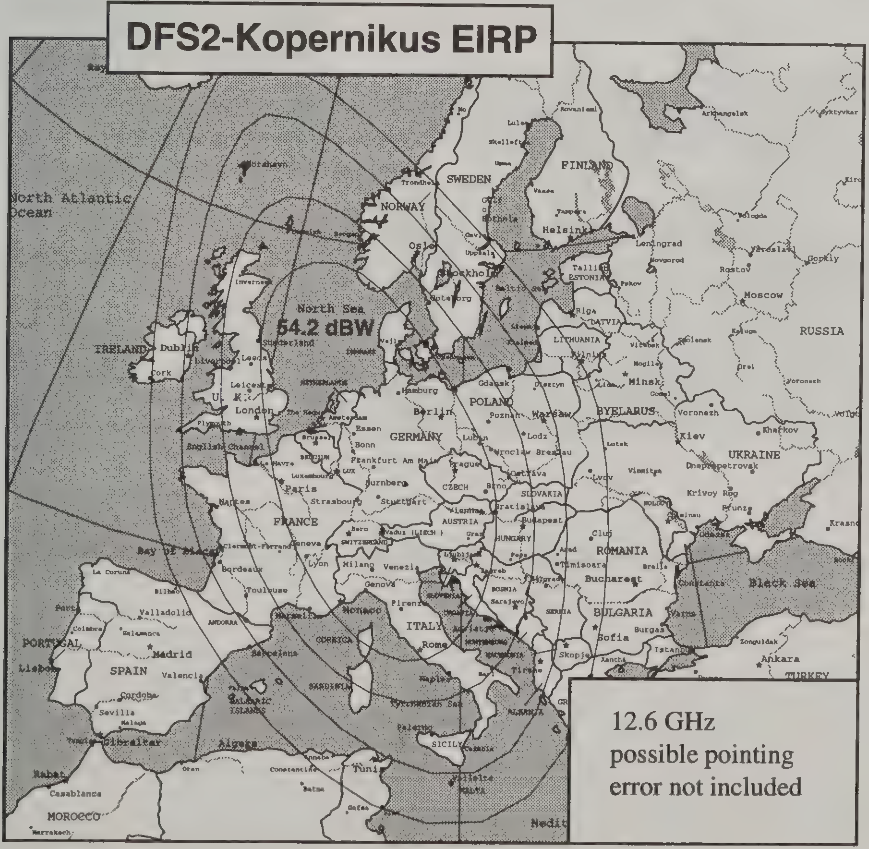


DFS1-Kopernikus G/T

11.5 GHz
possible pointing
error not included

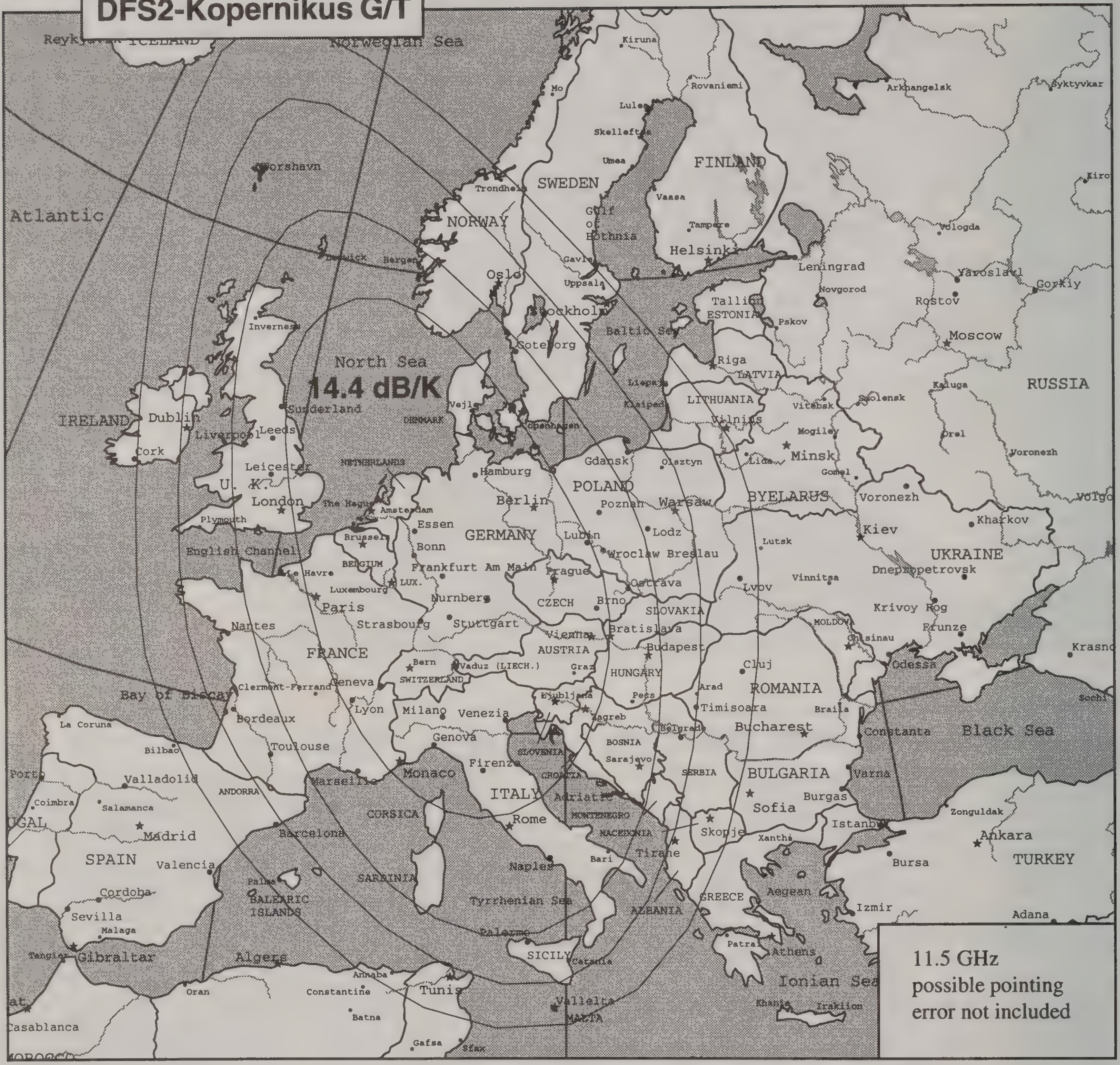


11.5 GHz
possible pointing
error not included



12.6 GHz
possible pointing
error not included

DFS2-Kopernikus G/T



TV-SAT 2 At A Glance

Satellite name: .... TV-SAT 2, 359.4°E (.6°W)*
Spacecraft data:
Mass (in orbit): .... 1,300 kg
Primary power (EOL): .... 3,215 W
Eclipse protection: .... None
Stabilization: 3-axis
Launch date: .... August 1989
Launch vehicle: .... Ariane 44L
Expected lifetime: .... 10 years

Transponders:
Number: 5
Power output: .... 230 W
Polarization: .... LHCP
Redundancy: .... 1 backup (TWT)

Manufacturer: .... Eurosatellite

*This satellite is leased to Telenor Norway for DTH in Scandinavia

TV-SAT 2 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Downlink(GHz)
2	LHCP	27	65.8	11.746
6	LHCP	27	65.8	11.823
10	LHCP	27	65.8	11.900
14	LHCP	27	65.8	11.976
18	LHCP	27	65.8	12.053

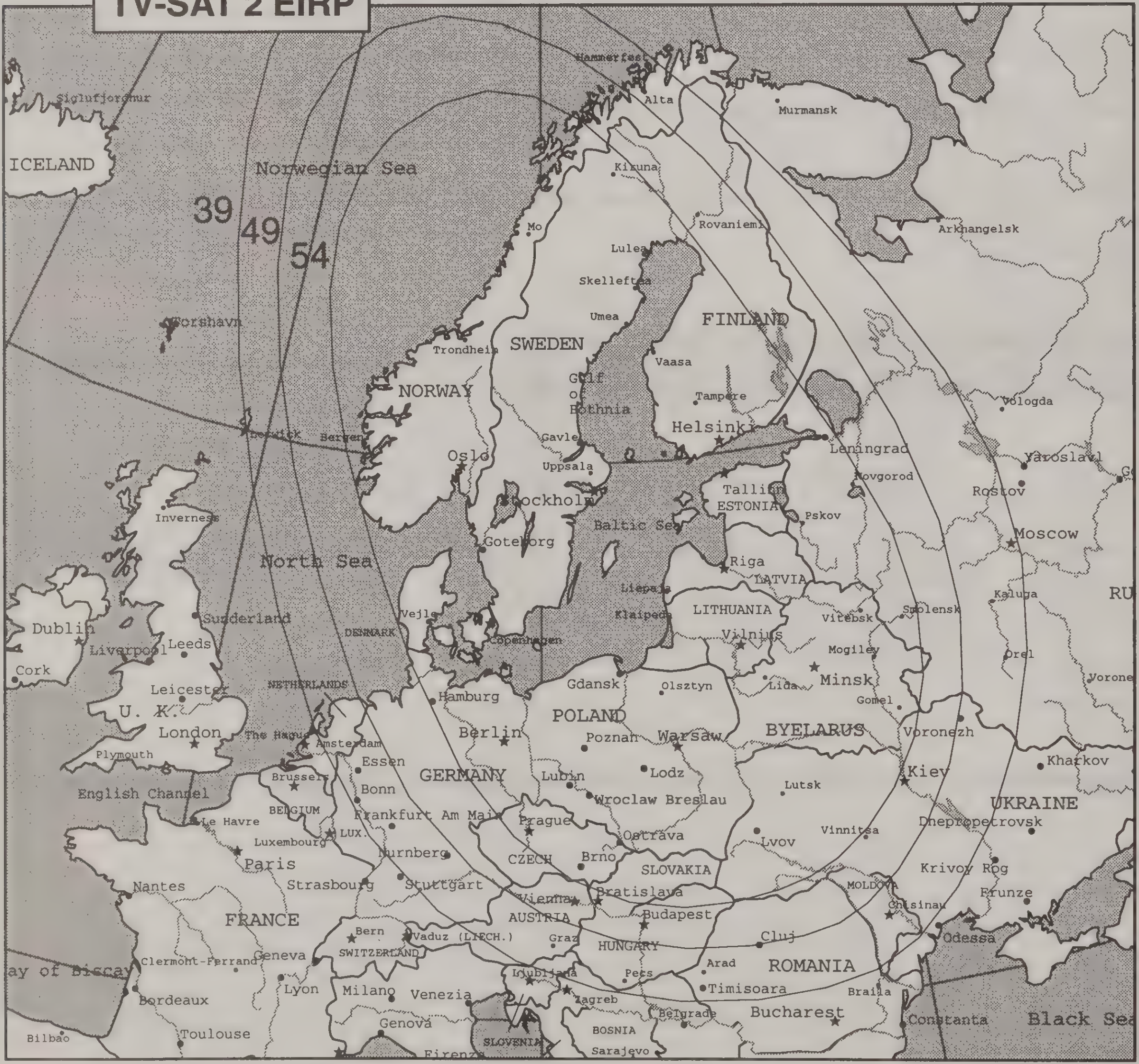
TV-SAT 2

Orbital location:	359.4°E (.6°W)
Launch:	August 1989, Ariane 44L
Expected lifetime:	10 years
Expected end of life:	1998

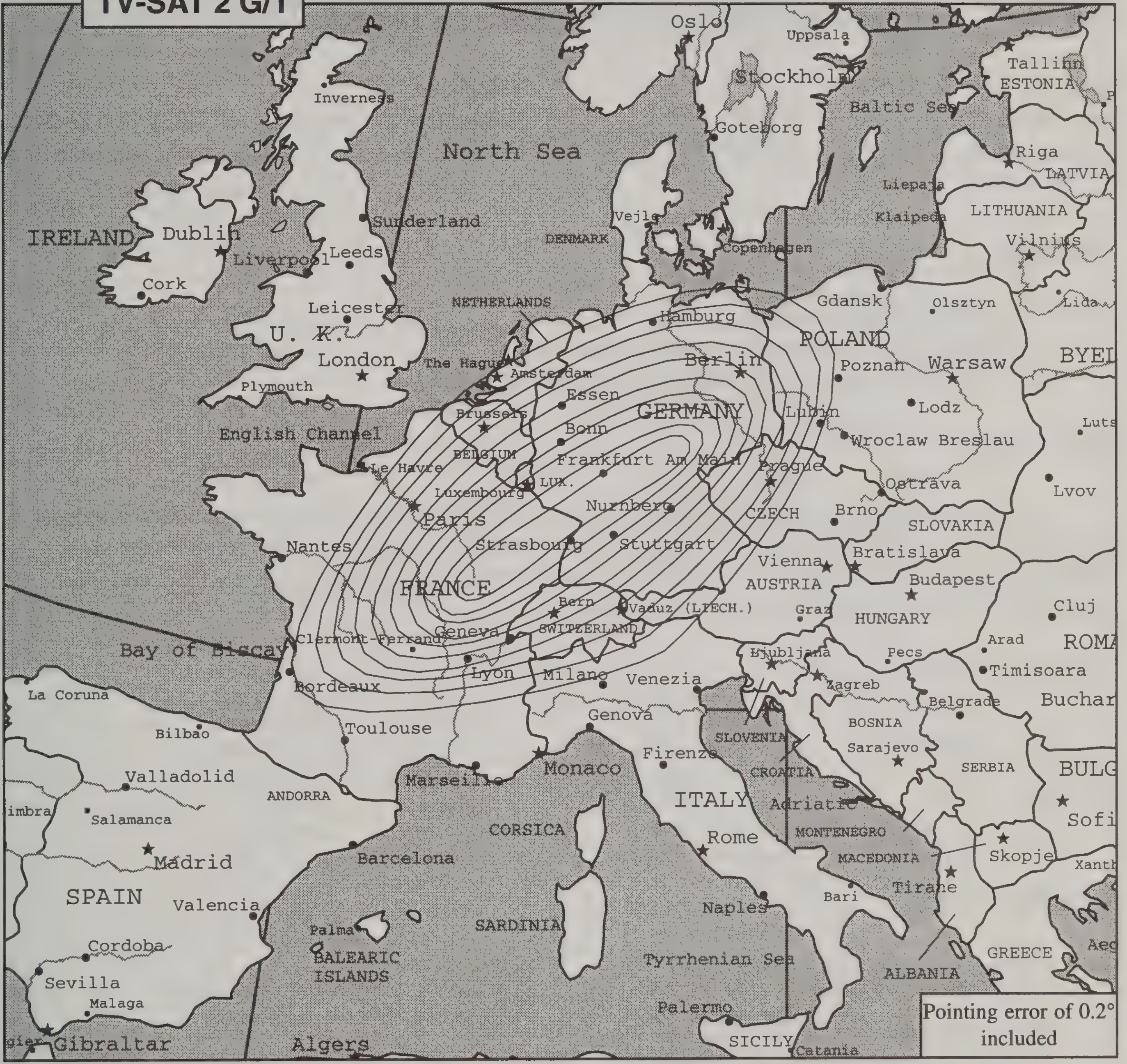
Antennas beam coverage overview:

DBS:	Scandinavia

TV-SAT 2 EIRP



TV-SAT 2 G/T



Pointing error of 0.2° included

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Contacts:

Chen Ji Bin, Vice President
Yang Xie-Ming, Director of Marketing Department
Zhang Ke-Ping, Director of Marketing Department

Overview:

APT launched its first satellite, Apstar-I, on July 21, 1994. Its coverage area includes southeast and northern Asia. APT launched its second satellite, Apstar-IA on June 3, 1996. Its coverage area includes southeast and northern Asia and India. Apstar-IIR will be launched in April 1997 and will cover all visible land masses excluding South Africa.

Services Offered:

- Television
- Data
- Voice
- Telecommunications

Satellite Control:

Satellite control:	Hong Kong
TT&C stations:	Hong Kong

APSTAR SYSTEM At A Glance

Satellite name:	Apstar-I, 138°E; Apstar-IA, 134°E; Apstar-IIR, 77°E (to be launched)
Spacecraft data:	
Area of coverage:	southeast and northern Asia (I); southeast and northern Asia and India (IA); all visible land masses excluding southern Africa (IIR)
Mass (in orbit):	560 kg (I & IA); 1,415 kg (IIR)
Primary power:	1,072 W (I & IA); 8,000 W (IIR)
Eclipse protection:	All transponders
Stabilization:	Spin (1, IA); 3-axis (IIR)
Launch date:	July 21, 1994 (I); July 3, 1996 (IA); April 1997 (IIR)
Launch vehicle:	Long March-3 (I, IA); Long March-3B (IIR)
Expected lifetime:	12 years (I); 10 years (IA); 15 years (IIR)
Transponders:	
Number:	24
Frequency band:	C-band
Power output:	16 W TWTA
Uplink frequency:	5.845-6.425 GHz
Downlink frequency:	3.620-4.200 GHz
Polarization:	Linear
Bandwidth:	20 @ 36 MHz, 4 @ 72 MHz
EIRP:	36.4 dBW (horizontal transponders), 37.3 dBW (vertical transponders)
Redundancy:	24:30
G/T:	-4 dB/K (EOC)
Single carrier flux density:	-88 dBW/sq.m., -78 dBW/m^2 to -88 dBW/m^2
Manufacturer:	GM-Hughes (I, IA); Space System/Loral (IIR)

Apstar-I and -IA Transponder Frequency Plan

Tr.#	Pol.	EIRP	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1A	Linear	34	36	5.885	3.660*
1B	Linear	34	36	5.885	3.660*
2A	Linear	34	36	5.965	3.740
2B	Linear	34	36	5.985	3.760
3A	Linear	34	36	6.025	3.800*
3B	Linear	34	36	6.045	3.820*
4A	Linear	34	36	6.065	3.840
4B	Linear	34	36	6.085	3.860
5A	Linear	34	36	6.105	3.880*
5B	Linear	34	36	6.125	3.900*
6A	Linear	34	36	6.145	3.920
6B	Linear	34	36	6.165	3.940
7A	Linear	34	36	6.185	3.960*
7B	Linear	34	36	6.205	3.980*
8A	Linear	34	36	6.225	4.000
8B	Linear	34	36	6.245	4.020
9A	Linear	34	36	6.265	4.040*
9B	Linear	34	36	6.285	4.060*
10A	Linear	34	36	6.305	4.080
10B	Linear	34	36	6.325	4.100
11A	Linear	34	36	6.345	4.120*
11B	Linear	34	36	6.365	4.140*
12A	Linear	34	36	6.385	4.160
12B	Linear	34	36	6.405	4.180

*Enhanced in India

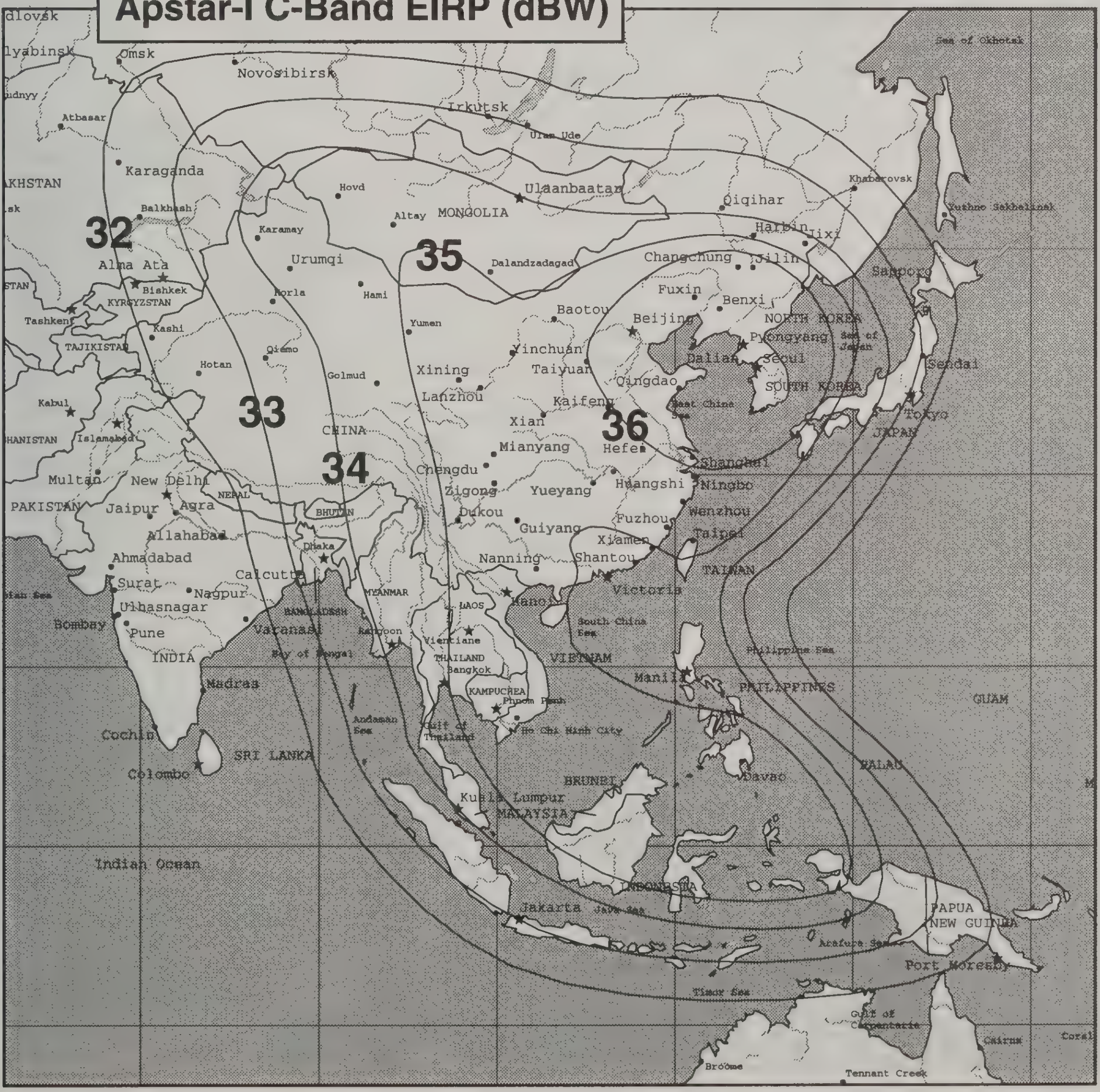
Apstar-I

Orbital location:	138ºE
Launch:	July 21, 1994, Long March-3
Expected lifetime:	12 years
Expected end of life:	2006

Antennas beam coverage overview:

C-band:	southeast and northern Asia

Apstar-I C-Band EIRP (dBW)



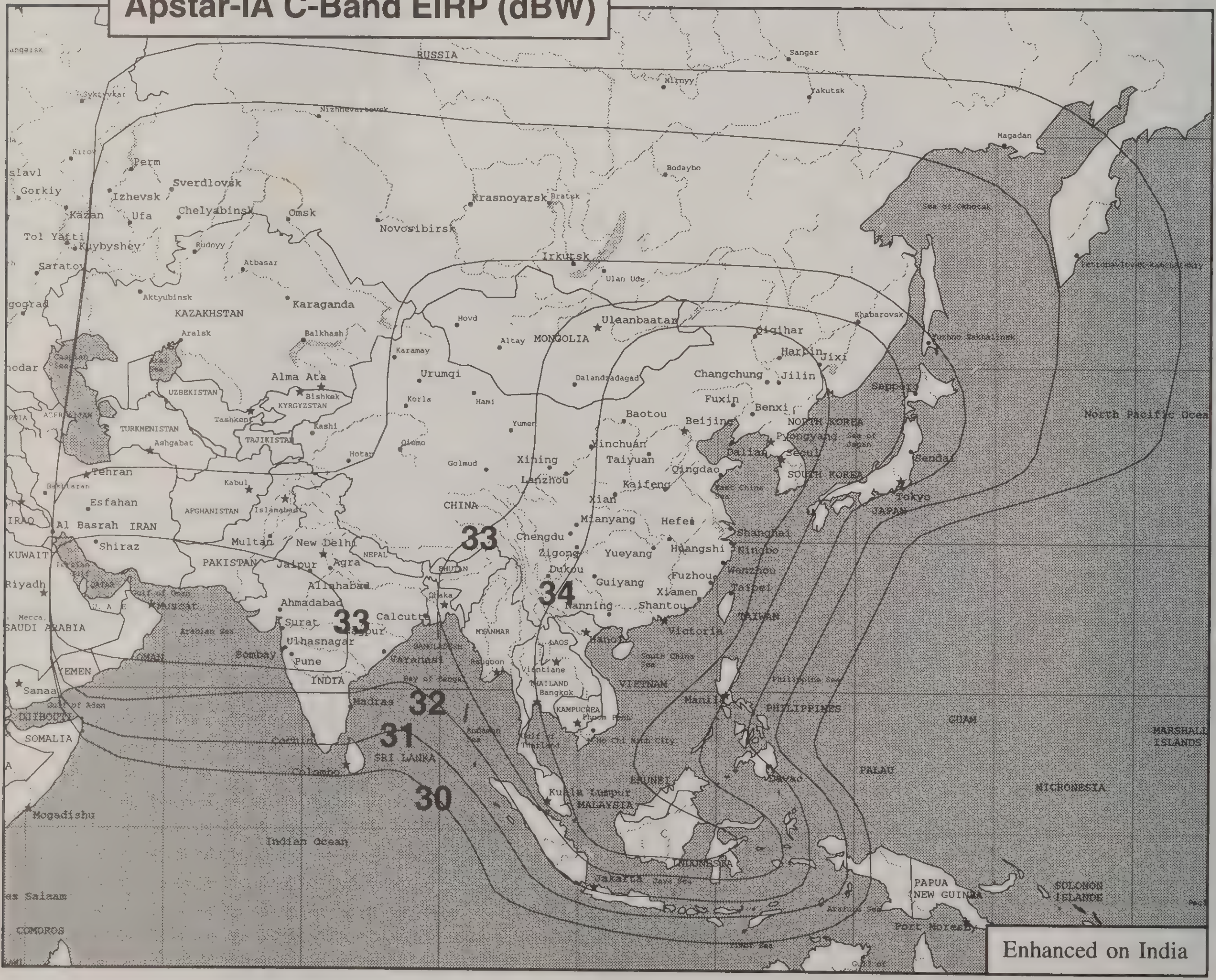
Apstar-IA

Orbital location: 134ºE
Launch: July 3, 1996, Long March-3
Expected lifetime: 10 years
Expected end of life: 2006

Antennas beam coverage overview:

C-band: southeast and northern Asia and India

Apstar-IA C-Band EIRP (dBW)



Enhanced on India

Apstar-IIR C-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1A	Linear	36	5.868	3.643
1B	Linear	36	5.885	3.660
2A	Linear	36	5.905	3.680
2B	Linear	36	5.925	3.700
3A	Linear	36	5.945	3.720
3B	Linear	36	5.965	3.740
4A	Linear	36	5.985	3.760
4B	Linear	36	6.005	3.780
5A	Linear	36	6.025	3.800
5B	Linear	36	6.045	3.820
6A	Linear	36	6.065	3.840
6B	Linear	36	6.085	3.860
7A	Linear	36	6.105	3.880
7B	Linear	36	6.125	3.900
8A	Linear	36	6.145	3.920
8B	Linear	36	6.165	3.940
9A	Linear	36	6.185	3.960
9B	Linear	36	6.205	3.980
10A	Linear	36	6.225	4.000
10B	Linear	36	6.245	4.020
11A	Linear	36	6.265	4.040
11B	Linear	36	6.285	4.060
12A	Linear	36	6.305	4.080
12B	Linear	36	6.325	4.100
13A	Linear	36	6.345	4.120
13B	Linear	36	6.365	4.140
14A	Linear	36	6.385	4.160
14B	Linear	36	6.405	4.180

Apstar-IIR Ku-Band Transponder Frequency Plan

Beam #1 and Beam #2

Tr.#	Pol.	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1A	Linear	36	14.022	12.272*
1B	Linear	36	14.0435	12.2935**
2A	Linear	36	14.074	12.385+
2B	Linear	36	14.1045	12.3545+
3A	Linear	36	14.135	12.385*
3B	Linear	36	14.1655	12.4155**
4A	Linear	36	14.196	12.446+
4B	Linear	36	14.2265	12.4765+
5A	Linear	36	14.257	12.507*
5B	Linear	36	14.2875	12.5375**
6A	Linear	36	14.318	12.568+
6B	Linear	36	14.3485	12.5985+
7A	Linear	36	14.379	12.629*
7B	Linear	36	14.4095	12.6595**
8A	Linear	36	14.440	12.690+
8B	Linear	36	14.4705	12.7205+

*May be switched from beam #1 to beam #2 and vice versa
**Beam #2 only
+Beam #1 only

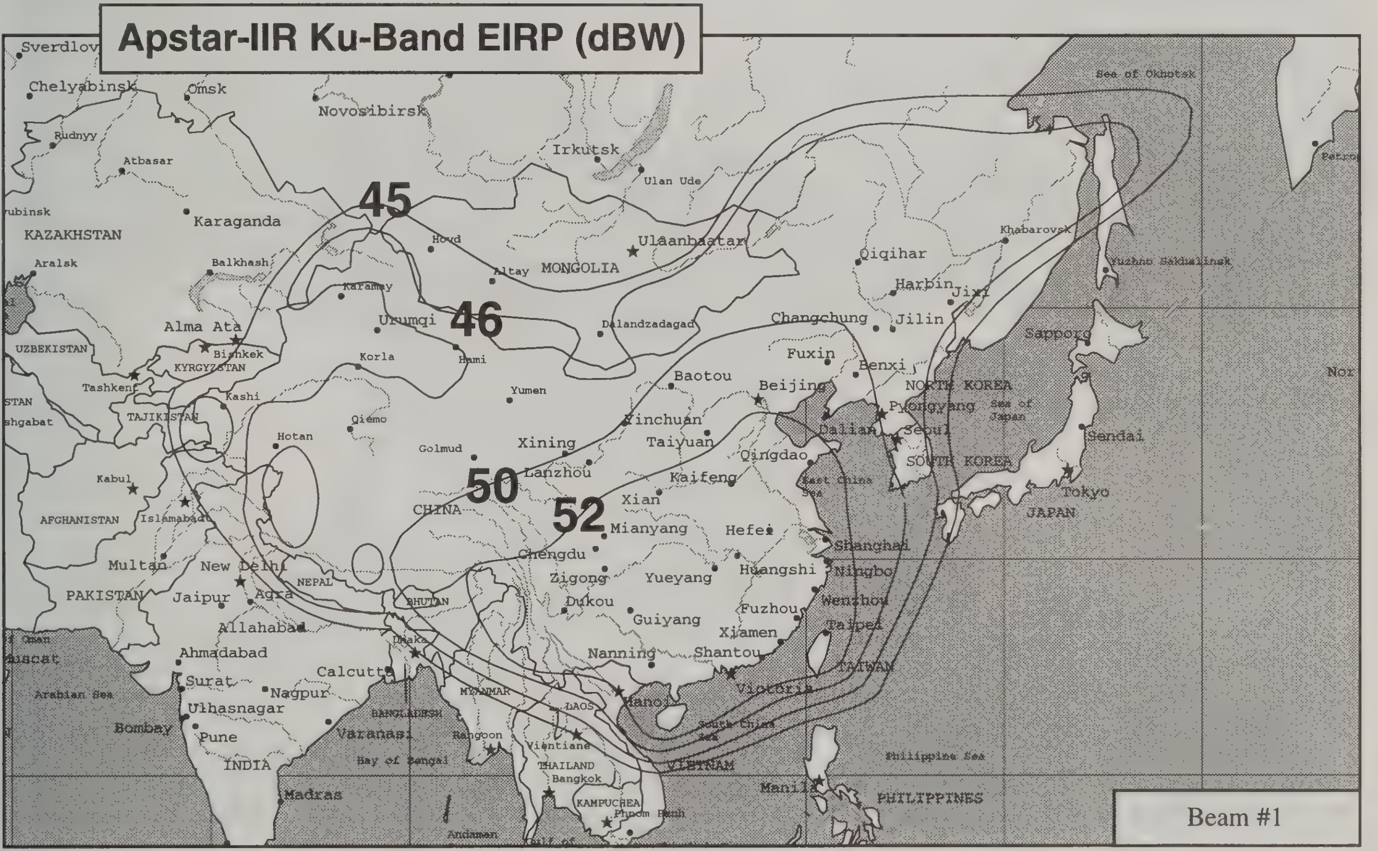
Apstar-IIR

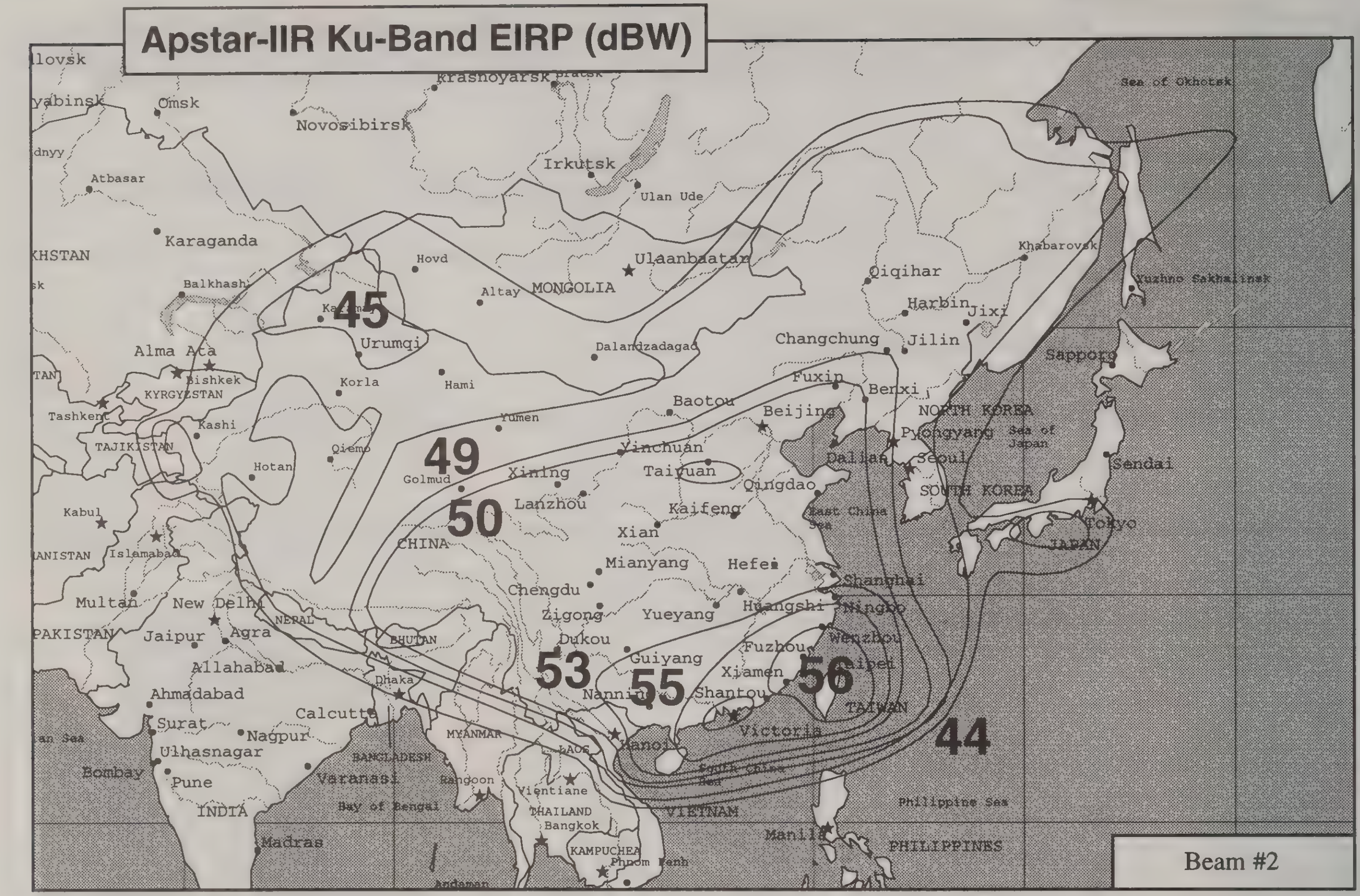
Orbital location:	77ºE (to be launched)
Launch:	April 1997, Long March-3B
Expected lifetime:	15 years
Expected end of life:	2012

Antennas beam coverage overview:

C-band and Ku-band:	all visible land massess excluding southern Africa

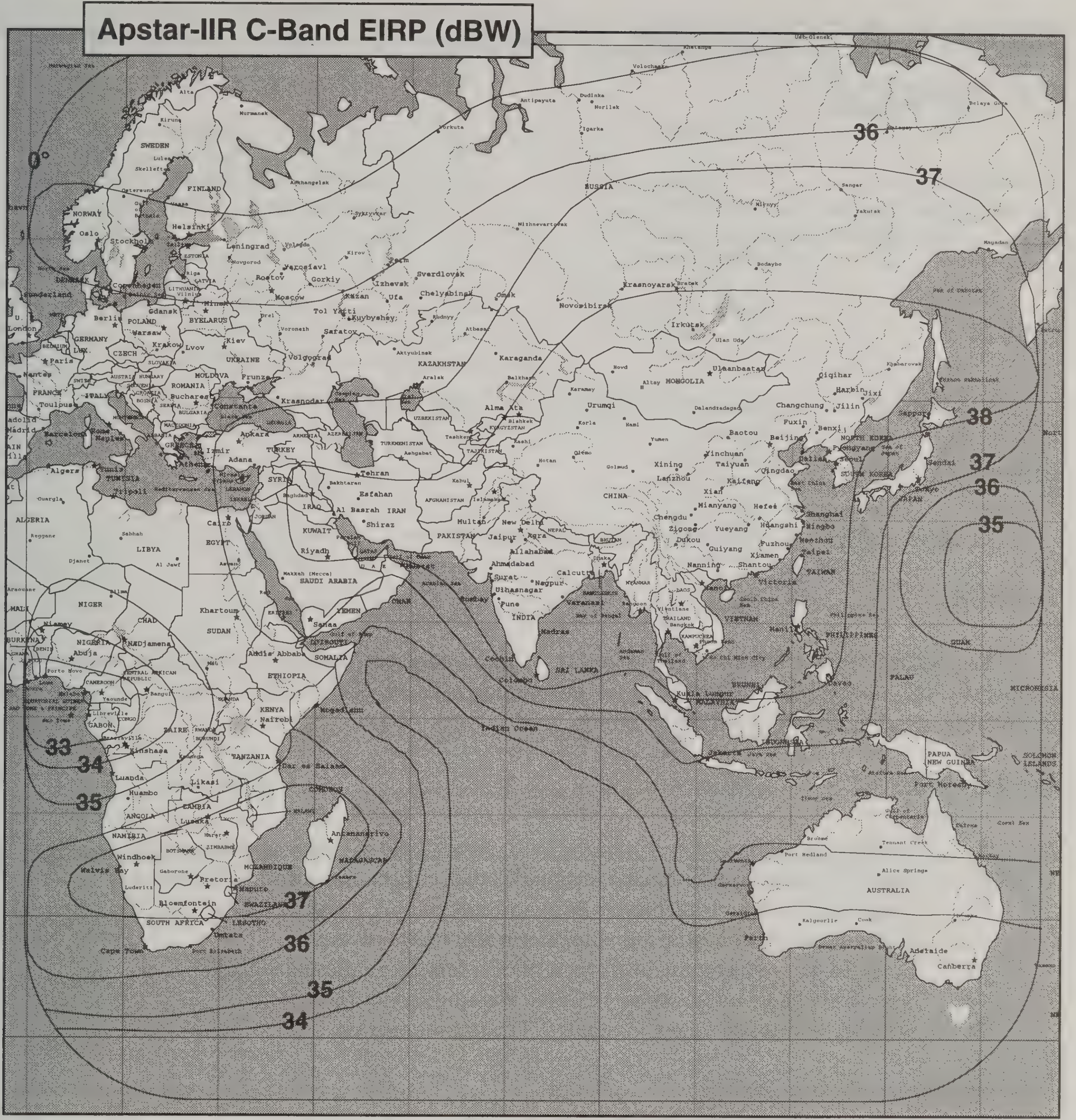
Apstar-IIR Ku-Band EIRP (dBW)





Apstar-IIR Ku-Band EIRP (dBW)

Beam #2



Apstar-IIR C-Band EIRP (dBW)

INDIAN DEPARTMENT OF SPACE

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Contact:

L. S. Satyamurthy, Counsellor, (202)939-9811, facsimile (202)939-9870

Booking Contact:

Dr. S. V. Kibe, Deputy Director, Insat Programme Office

Overview:

The Indian National Satellite System (Insat) is a multi-purpose, multi-agency operational system for domestic long-distance telecommunications, meteorological earth observation and data relay, and nationwide direct satellite television broadcasting.

Services Offered:

- Continuous synoptic meteorological earth observation in visible and infrared bands
- Data collection from automatic unattended data collection platforms (DCPs)
- Direct satellite television broadcasting to community TV receivers, TV and radio programming distribution for national and regional networks
- Long-distance telecommunications services (data, facsimile and voice)
- Selectively addressable cyclone disaster warning service (DWS)
- Standard time and frequency signals (STFS) dissemination

Satellite Control Network:

Satellite control:	Hassan, Karnataka
TT&C stations:	Hassan, Karnataka

INSAT-1 SYSTEM At A Glance

Satellite name:	Insat-1D, 83°E
Spacecraft data:	
Mass (in orbit):	650 kg
Primary power (EOL):	975 W (summer solstice), 1090 W (autumn equinox)
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	June 1990
Launch vehicle:	Delta
Expected lifetime:	7 years
Transponders:	
Number:	12 telecommunications, 2 TV broadcast
Power output:	4.5 W TWTA (telecommunications), 50 W TWTA (TV broadcast)
Polarization:	Linear (C-band), LHCP (S-band)
Uplink G/T:	-4.5 dB/°K (C-, S-band), -19 dB/°K (UHF)
Receive G/T:	-4.5 dB/°K
Single carrier saturation flux density:	-92 dBW/m² to -70 dBW/m² Gain settable over 22 dB range (telecommunications), AGC (S-band)
Manufacturer:	Ford Aerospace

Insat 1D Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	Linear	36	32	5.955	3.730
2	Linear	36	32	5.995	3.770
3	Linear	36	32	6.035	3.810
4	Linear	36	32	6.075	3.850
5	Linear	36	32	6.115	3.890
6	Linear	36	32	6.155	3.930
7	Linear	36	32	6.195	3.970
8	Linear	36	32	6.235	4.010
9	Linear	36	32	6.285	4.060
10	Linear	36	32	6.325	4.100
11	Linear	36	32	6.365	4.140
12	Linear	36	32	6.405	4.180
S1	LHCP	36	42	5.875	2.575
S2	LHCP	36	42	5.915	2.615

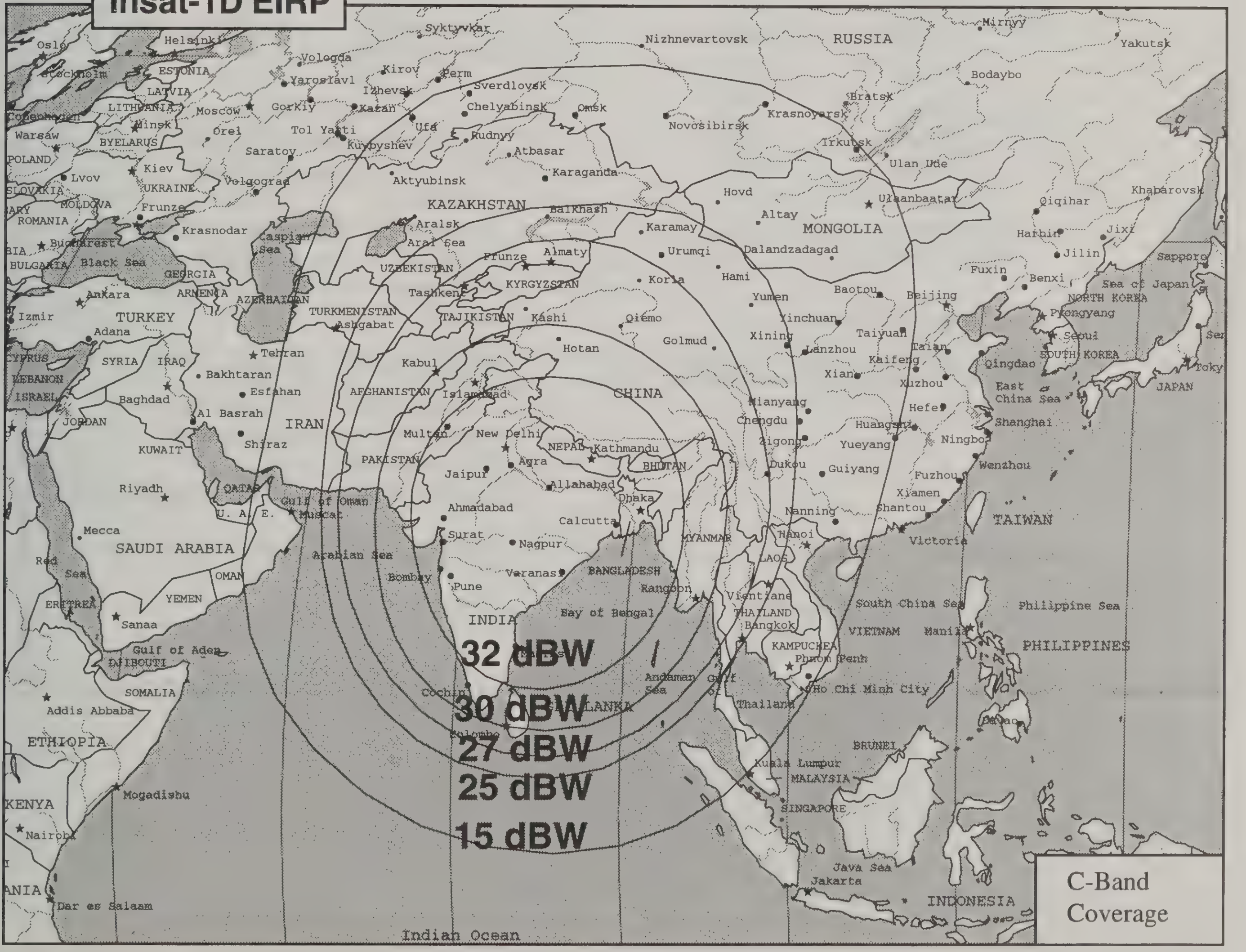
Insat-1D

Orbital location:	83ºE
Launch:	June 1990, Delta
Expected lifetime:	7 years
Expected end of life:	1997

Antennas beam coverage overview:

C-band, S-band:	Indian subcontinent

Insat-1D EIRP



C-Band Coverage

INSAT-2 SYSTEM At A Glance

Satellite name:	Insat-2A, 74°E; Insat-2B, 93.5°E; Insat-2C, 93.5°E; Insat-2D*, 83°E; Insat-2E*, TBA (to be launched)
Spacecraft data:	
Mass (in orbit):	905 kg (2A, 2B), 980 (2C, 2D), 1,180 (2E)
Primary power (EOL):	1,024 W (2A, 2B), 1,455 W (2C, 2D), 2 KW (2E)
Eclipse protection:	All transponders (2A, 2B), 745 W (2C, 2D), Full (2E)
Stabilization:	3-axis
Launch date:	July 9, 1992 (Insat-2A); July 22, 1993 (Insat-2B); December 6, 1995 (Insat-2C); July 1996 (Insat-2D); October 11, 1997 (Insat-2E)
Launch vehicle:	Ariane (2A, 2B, 2C, 2D)
Expected lifetime:	9 years (2A), 10 years (2B, 2C, 2D), 15 years (2E)
Transponders:	
Number:	18 (12 in conventional C-band, 6 in extended upper C-band)
Power output:	1,024 W
Polarization:	LHCP (S-band), Linear (C-band)
Redundancy:	Functional in conventional C-band, 2:3 in upper Ext-C- and S-bands
Receive G/T:	-5dB/°K
Single carrier saturation flux density:	-92 dBW/m^2 to -70 dBW/m^2 (C-, extended C- and S-band) Gain settable over 22dB range (C-, extended C- band) Gain settable over 12dB range (S-band)
Manufacturer:	Indian Space Research Organization

*Insat 2D and 2E to replace Insat 1D

Insat-2A Satellite Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	Linear	40	32	5.950	3.725
2	Linear	40	32	5.990	3.765
3	Linear	40	32	6.030	3.805
4	Linear	40	32	6.070	3.845
5	Linear	40	32	6.110	3.885
6	Linear	40	32	6.150	3.925
7	Linear	40	32	6.190	3.965
8	Linear	40	32	6.230	4.005
9	Linear	40	32	6.270	4.045
10	Linear	40	32	6.310	4.085
11	Linear	30	32	6.350	4.125
12	Linear	30	32	6.390	4.163
13	Linear	40	32	6.755	4.530
14	Linear	40	32	6.795	4.570
15	Linear	40	32	6.835	4.610
16	Linear	40	32	6.875	4.650
17	Linear	40	32	6.915	4.690
18	Linear	40	32	6.955	4.730
19	LHCP	40	42	5.870	2.570
20	LHCP	40	42	5.910	2.610
TT&C				6.410-6.425	4.185-4.200
DCS, VHRR, SAS&R					

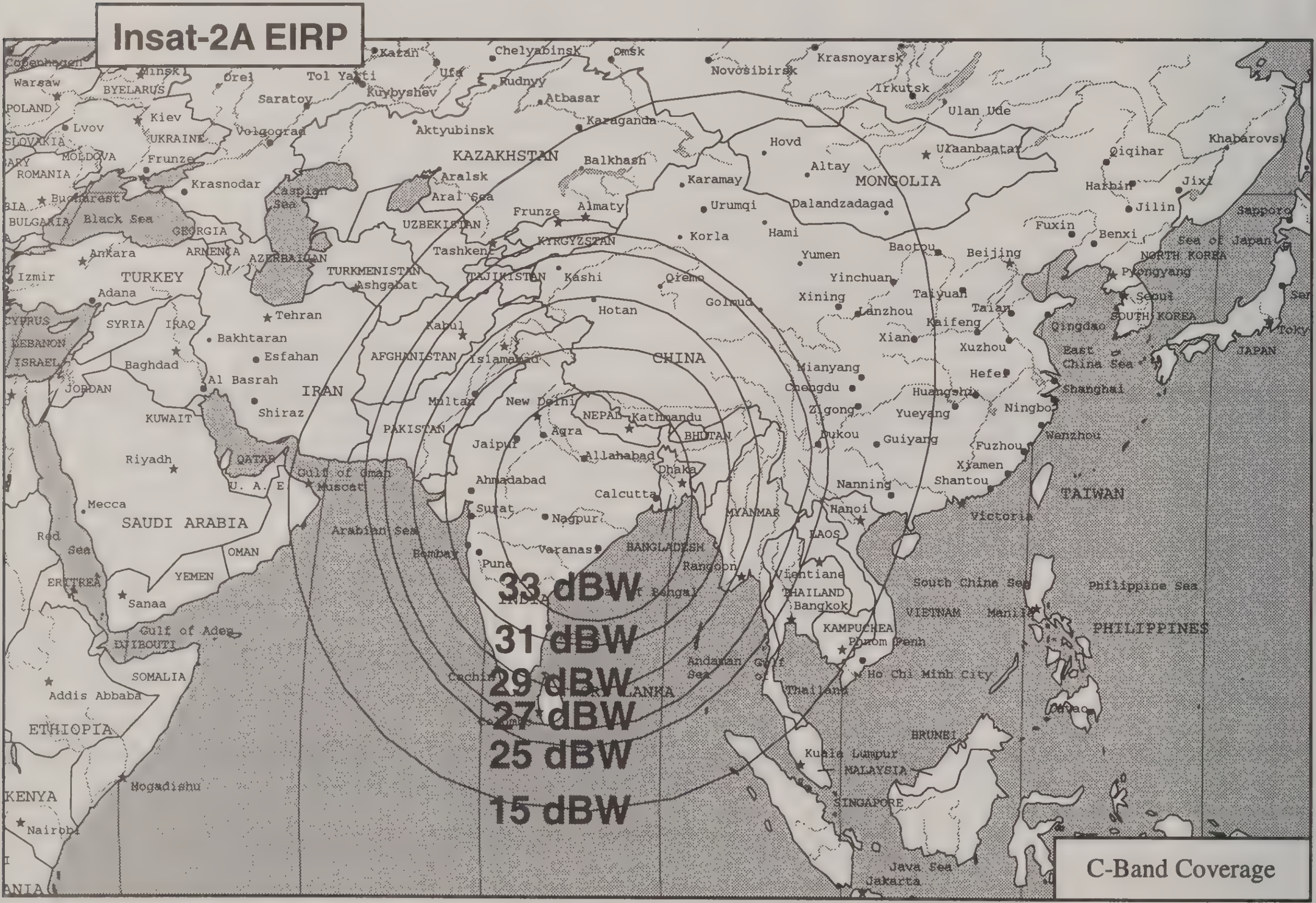
Insat-2A

Orbital position:	74°E
Launch:	July 9, 1992, Ariane
Expected lifetime:	9 years
Expected end of life:	2001

Antennas beam coverage overview:

C-band:	Indian subcontinent

Insat-2A EIRP



Insat-2B Satellite Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	Linear	40	32	5.970	3.745
2	Linear	40	32	6.010	3.785
3	Linear	40	32	6.050	3.825
4	Linear	40	32	6.090	3.865
5	Linear	40	32	6.130	3.905
6	Linear	40	32	6.170	3.945
7	Linear	40	32	6.210	3.985
8	Linear	40	32	6.250	4.025
9	Linear	40	32	6.290	4.065
10	Linear	40	32	6.330	4.105
11	Linear	30	32	6.365	4.140
12	Linear	30	32	6.395	4.170
13	Linear	40	32	6.755	4.530
14	Linear	40	32	6.795	4.570
15	Linear	40	32	6.835	4.610
16	Linear	40	32	6.875	4.650
17	Linear	40	32	6.915	4.690
18	Linear	40	32	6.955	4.730
19	LHCP	40	32	5.870	2.570
20	LHCP	40	32	5.910	2.610
TT&C				6.410-6.425	4.185-4.200
DCS, VHRR, SAS&R					

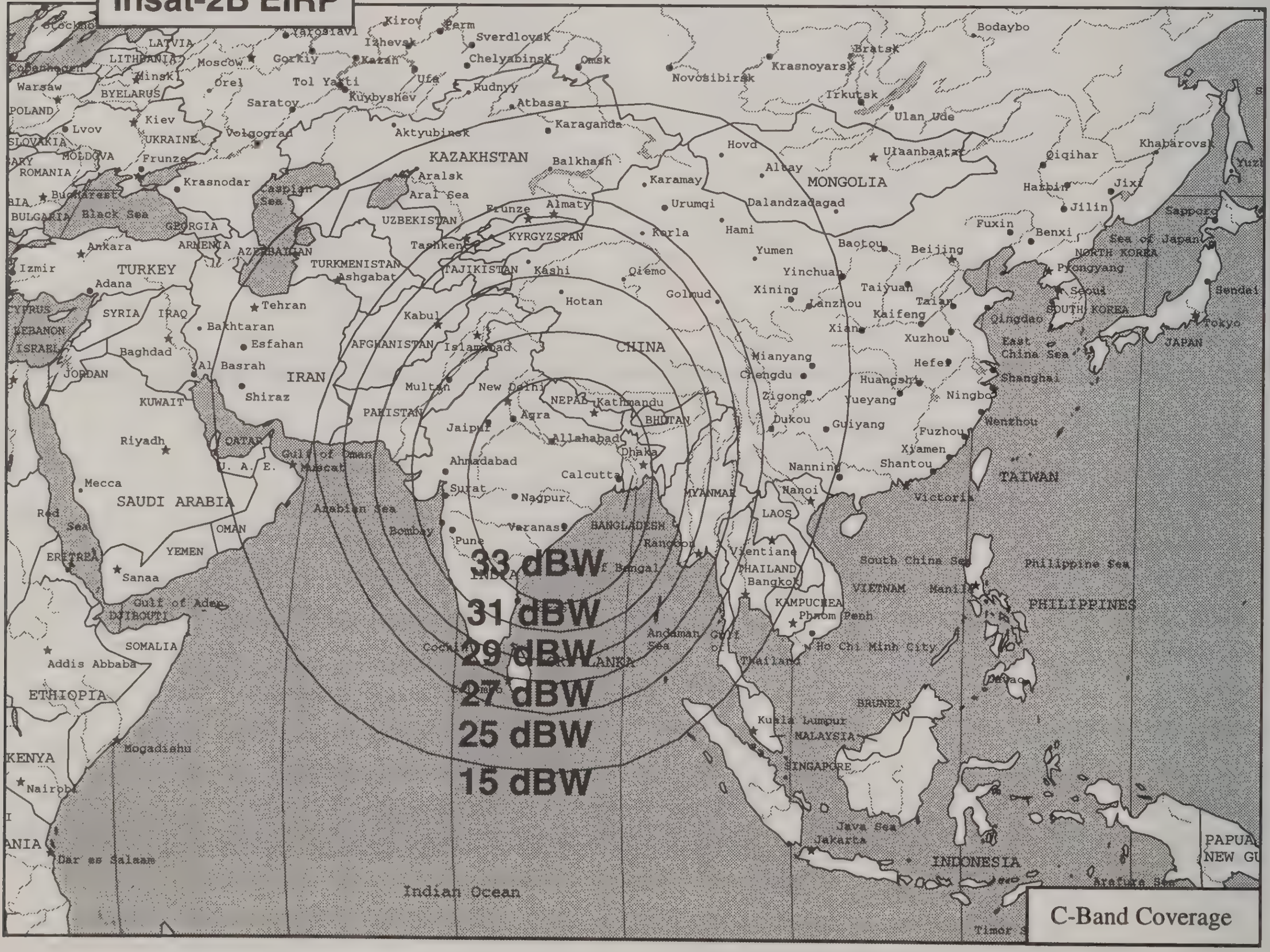
Insat-2B

Orbital position:	93.5°E
Launch:	July 22, 1993, Ariane
Expected lifetime:	10 years
Expected end of life:	2003

Antennas beam coverage overview:

C-band:	Indian subcontinent

Insat-2B EIRP



Insat-2C Satellite Transponder Frequency Plan

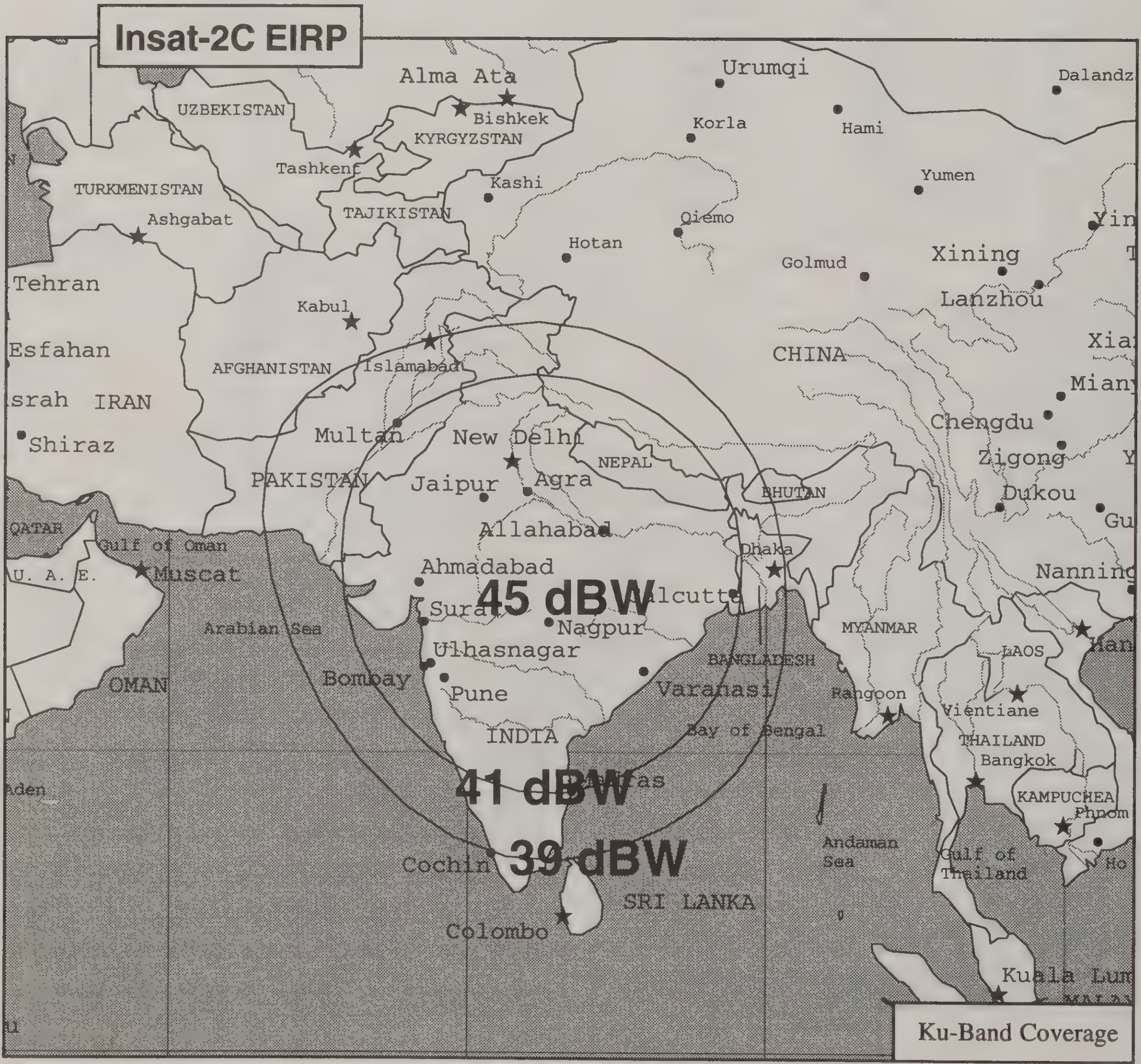
Tr.#	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1	36	5.950	3.725
2	36	5.990	3.765
3	36	6.030	3.805
4	36	6.070	3.845
5	36	6.110	3.885
6	36	6.150	3.925
7	36	6.190	3.965
8	36	6.230	4.005
9	36	6.270	4.045
10	36	6.310	4.085
11	36	6.350	4.125
12	36	6.390	4.165
13	36	6.755	4.530
14	36	6.795	4.570
15	36	6.835	4.610
16	36	6.875	4.650
17	36	6.915	4.690
18	36	6.955	4.730
20	36	5.910	2.610
21	18	6.460	2.510
22	18	2.680	3.690
TT&C		6.410	4.185
TT&C		6.425	4.200

Insat-2C

Orbital position:	93.5°E
Launch:	December 6, 1995, Ariane
Expected lifetime:	10 years
Expected end of life:	2005

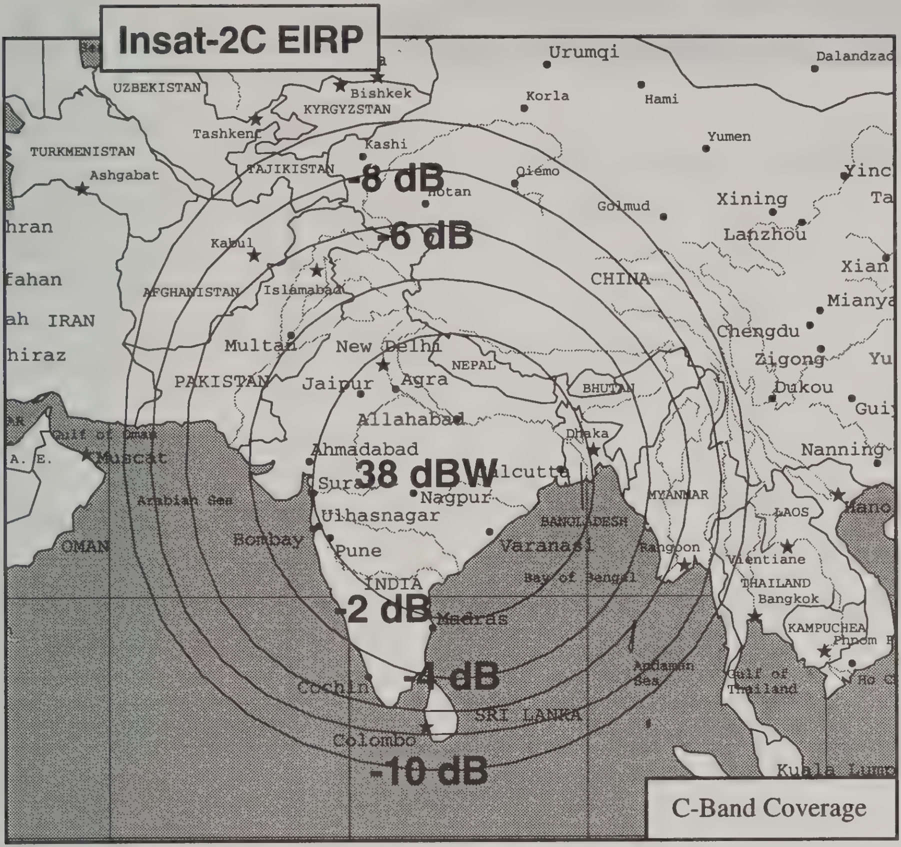
Antennas beam coverage overview:

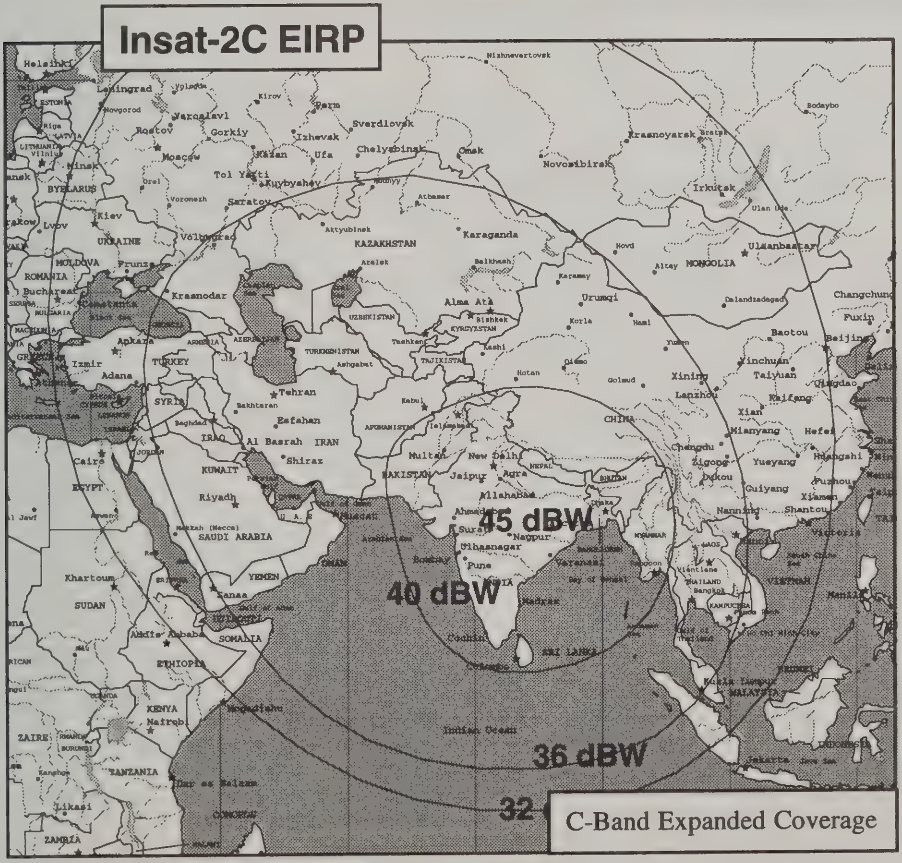
C- and Ku-band:	Indian subcontinent



Insat-2C EIRP

Ku-Band Coverage


Insat-2C EIRP
38 dBW
-2 dB
-4 dB
-6 dB
-8 dB
-10 dB
C-Band Coverage
UZBEKISTAN
Bishkek
KYRGYZSTAN
Urumqi
Korla
Hami
Dalandzad
Tashkent
TURKMENISTAN
Ashgabat
TAJIKISTAN
Kashi
Qiemo
Hotan
Golmud
Yumen
Xining
Lanzhou
Kabul
AFGHANISTAN
Islamabad
CHINA
Xian
Mianya
Chengdu
Zigong
Dukou
IRAN
Multan
New Delhi
NEPAL
PAKISTAN
Jaipur
Agra
BHUTAN
Allahabad
Dhaka
Nanning
Gulf of Oman
Muscat
Ahmadabad
Surat
Calcutta
Nagpur
MYANMAR
LAOS
Arabian Sea
Ulhasnagar
BANGLADESH
OMAN
Bombay
Pune
Varanasi
Rangoon
Vientiane
INDIA
Bay of Bengal
THAILAND
Bangkok
Madras
KAMPUCHEA
Andaman Sea
Gulf of Thailand
Cochin
SRI LANKA
Colombo


Insat-2C EIRP
45 dBW
40 dBW
36 dBW
32
C-Band Expanded Coverage
KAZAKHSTAN
MONGOLIA
UKRAINE
TURKEY
IRAN
IRAQ
SAUDI ARABIA
EGYPT
SUDAN
ETHIOPIA
SOMALIA
KENYA
TANZANIA
AFGHANISTAN
PAKISTAN
CHINA
INDIA
SRI LANKA
MALAYSIA
Indian Ocean

Insat-2D Satellite Transponder Frequency Plan

Tr.#	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1	36	5.970	3.745
2	36	6.010	3.785
3	36	6.050	3.825
4	36	6.090	3.865
5	36	6.130	3.905
6	36	6.170	3.945
7	36	6.210	3.985
8	36	6.250	4.025
9	36	6.290	4.065
10	36	6.330	4.105
11	25	6.360	4.140
12	25	6.395	4.170
19	36	5.870	2.570
21	18	6.460	2.510
22	18	2.680	3.690
TT&C		6.410	4.185
TT&C		6.425	4.200

P.T. SATELIT PALAPA INDONESIA

Mulia Center (Sentra Mulia)
12th Floor, Suite 1201
Jl. H.R. Rasuna Said Kav. X6, No. 8
Jakarta 12940
INDONESIA

Telephone:	+62 (21)545-1745-47
Facsimile:	+62 (21)545-1748

Contact:

Mr. Iwan Krisnadi

Overview:

Operates the Palapa domestic satellite system. Provides domestic telephony, TV and data communications.

Services Offered:

- Public telephony
- Data communications
- Television
- Circuits and transponder leasing

Satellite Control Network:

Satellite control:	Daan Mogot, near Jakarta
TT&C stations:	Daan Mogot, near Jakarta

PALAPA SYSTEM At A Glance

Satellite name: Palapa B4, 118°E;
Palapa C1, 150.5°E (replaced B2P);
Palapa C2, 113°E (replaced B2R);
Palapa C3, TBA

Spacecraft data:
- Mass (in orbit): 628 kg (B); 1,308 kg (C)
- Primary power (EOL): 831 W (B); 3,400 W (C)
- Stabilization: Spin (B); Body stabilized (C)
- Launch date: May 13, 1992 (B4); January 31, 1996 (C1); May 15, 1996 (C2)
- Launch vehicle: Delta (B4); Atlas 2AS (C1); Ariane (C2)
- Expected lifetime: 8 years (B); 14 years (C)

Transponders:
- Number: 24 (B); 30 C-band, 4 Ku-band (C)
- Power output: 10 W TWTA (B); 21.75 W SSPA (C-band), 135 W TWTA (Ku-band) [C]
- Uplink frequency: 6 GHz
- Downlink frequency: 4 GHz
- Polarization: Linear
- Redundancy: 6 backups
- Bandwidth: 36 MHz

Single carrier saturation flux density: -89.5 dBW/sq.m. (B);
-95 dBW/sq.m. (C)

Manufacturer: Hughes

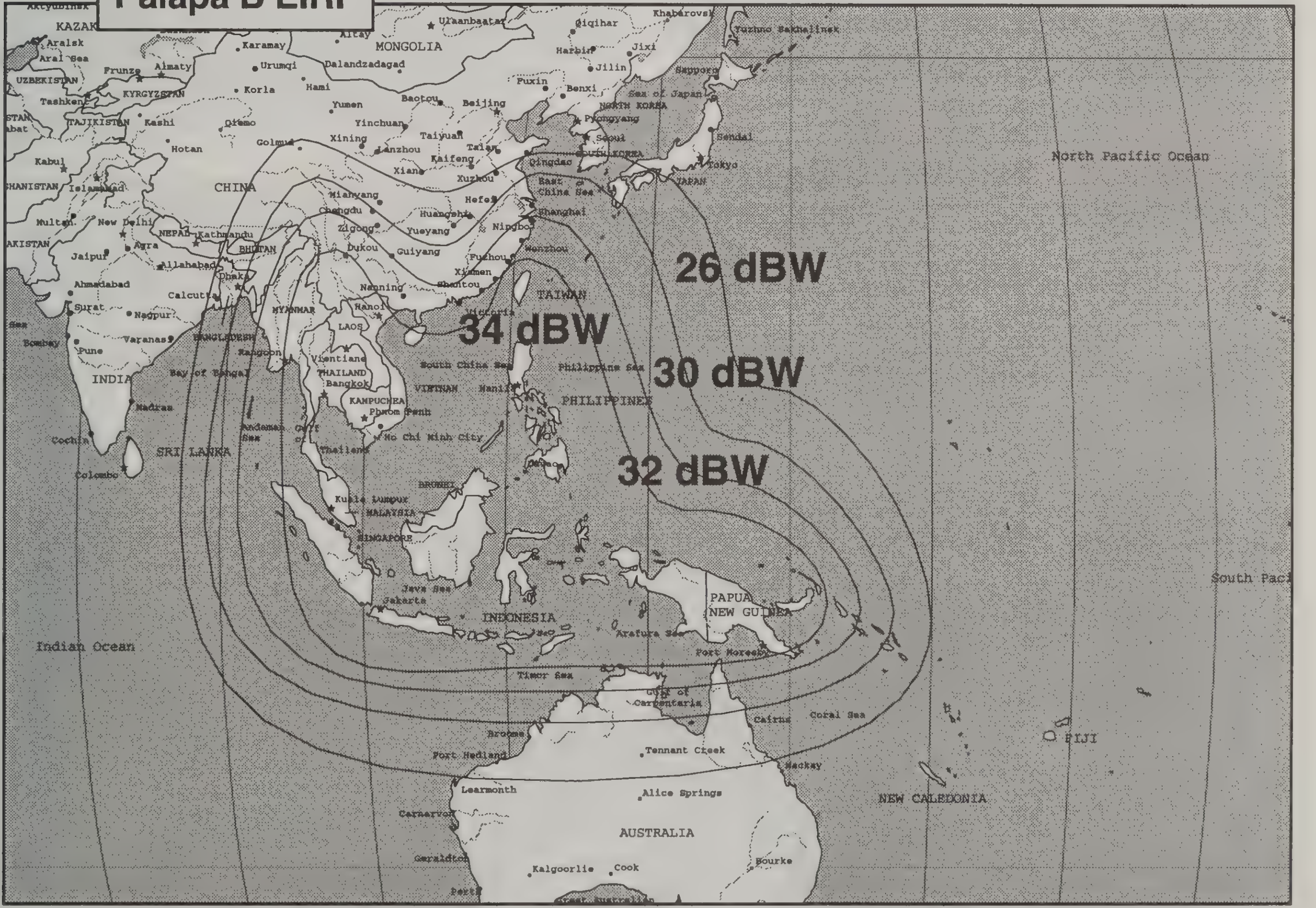
Palapa B4, C1, C2

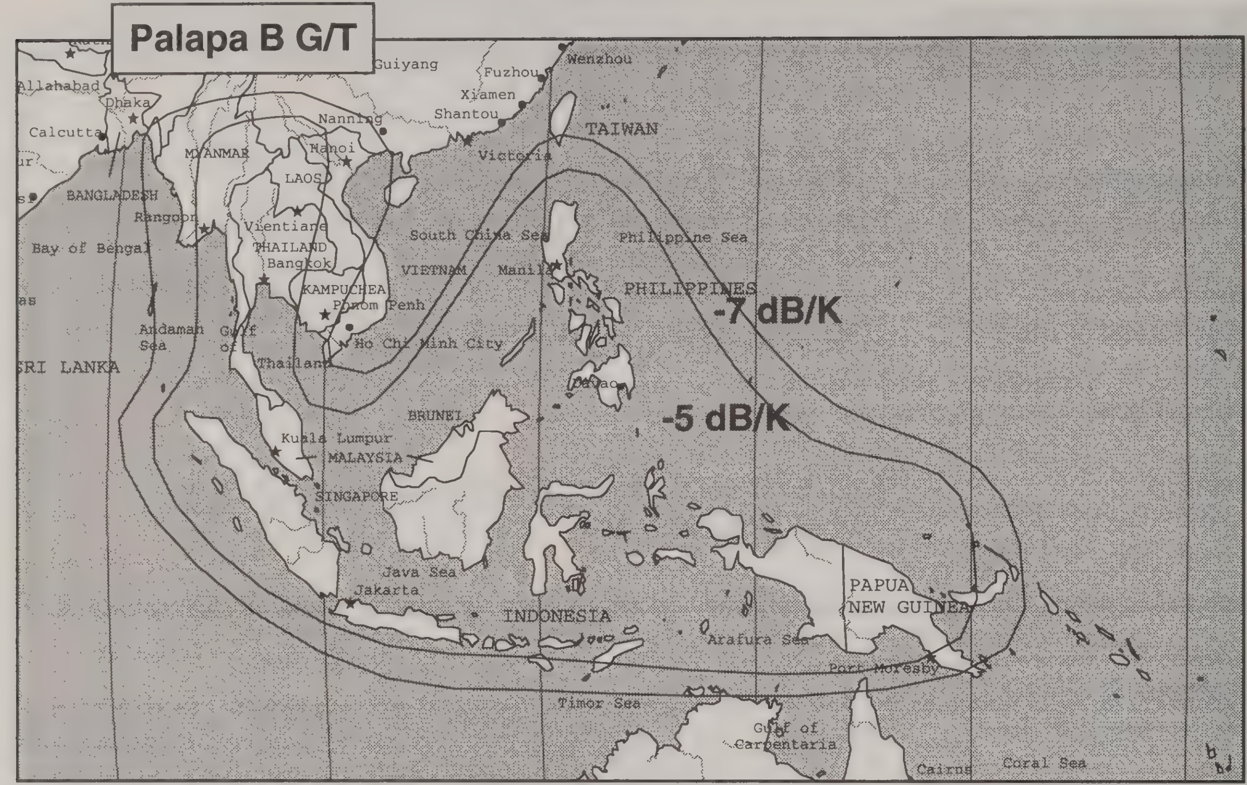
Orbital location:	118°E (B4), 150.5°E (C1), 113°E (C2)
Launch:	May 13, 1992, Delta (B4); January 31, 1996, Ariane 4 (C1); May 15, 1996, Ariane 4 (C2)
Expected lifetime:	8 years (B); 14 years (C)
Expected end of life:	2003 (B4), 2009 (C1); 2010 (C2)

Antennas beam coverage overveiw:

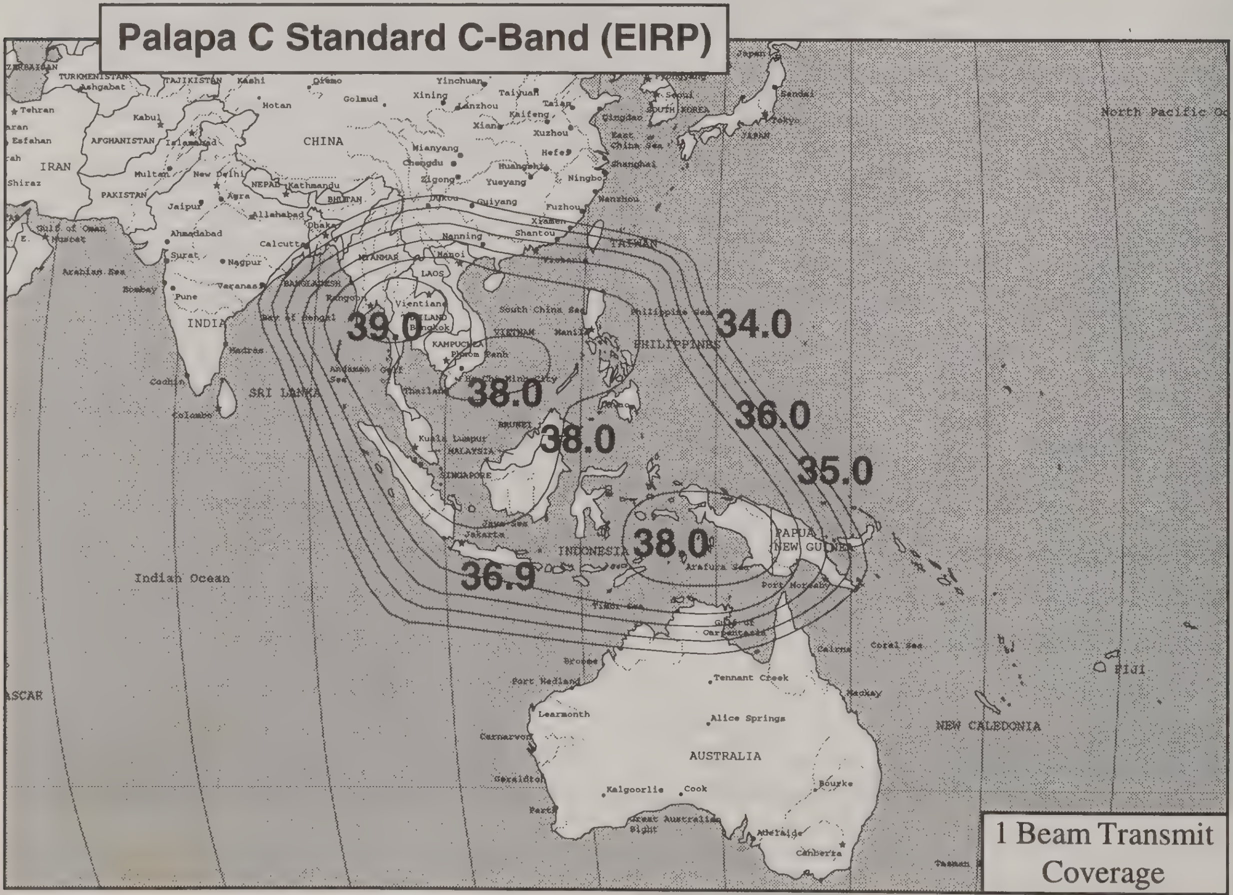
C-band:	Indonesia's archipelago, ASEAN countries, Papua New Guinea, North Australia

Palapa B EIRP



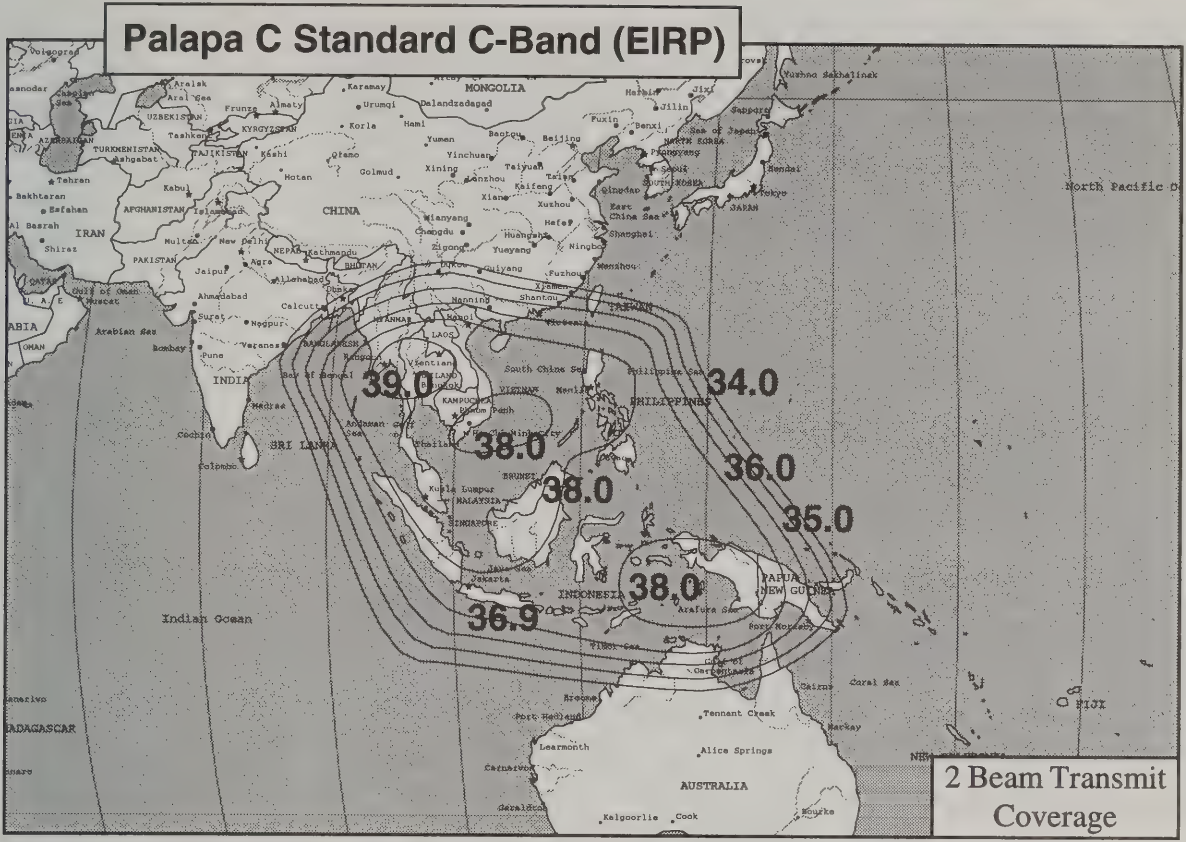


Palapa B G/T

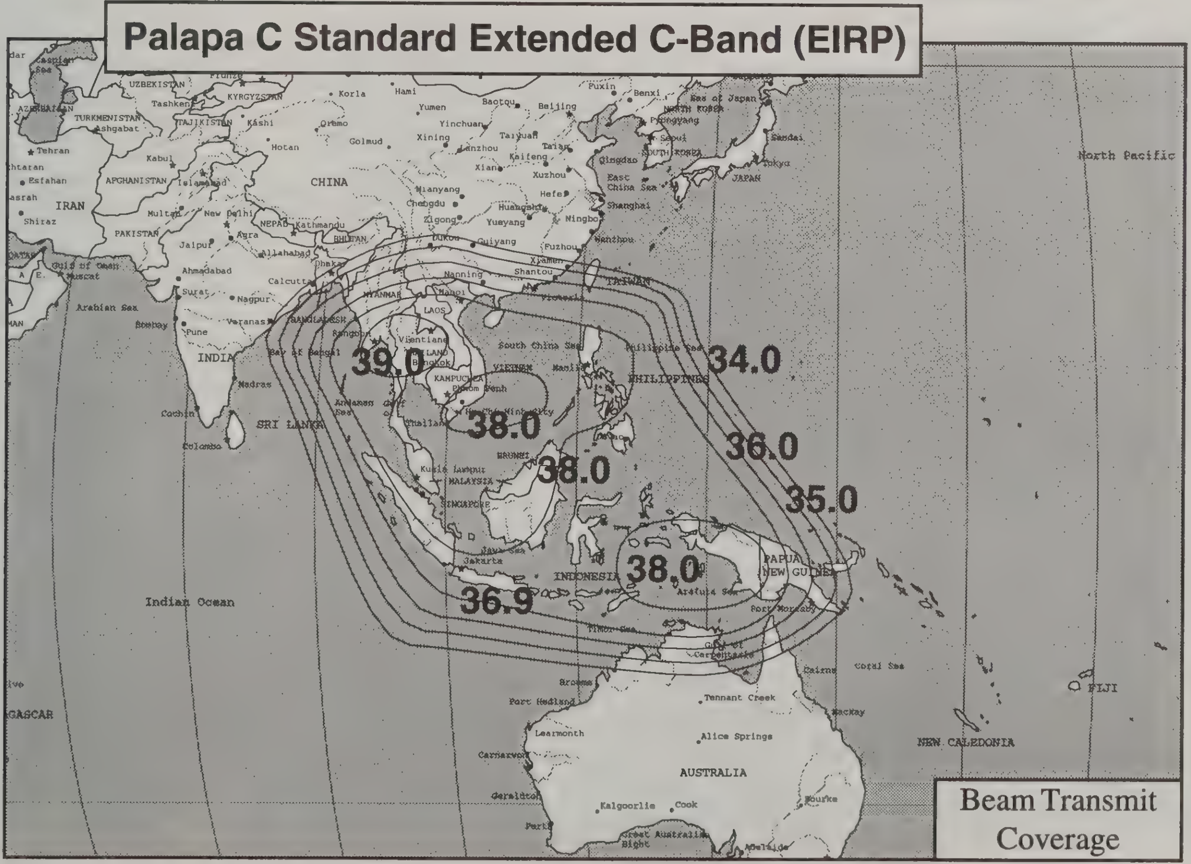


Palapa C Standard C-Band (EIRP)

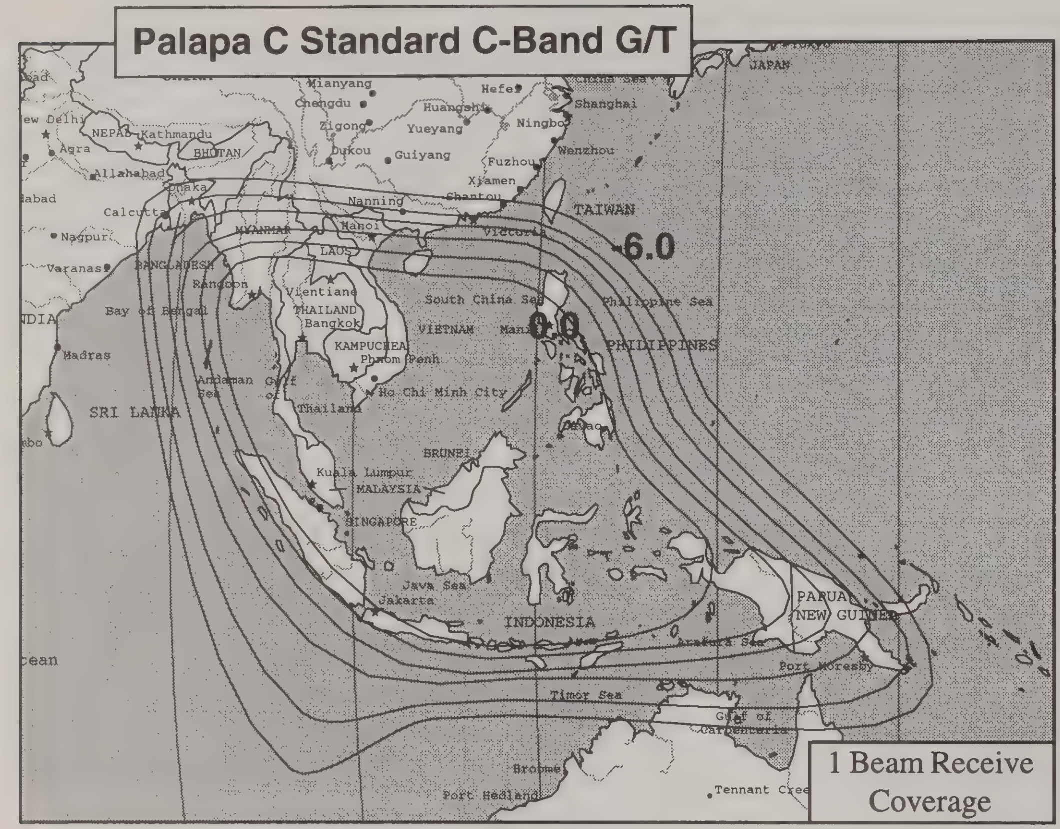
1 Beam Transmit Coverage



Palapa C Standard C-Band (EIRP)

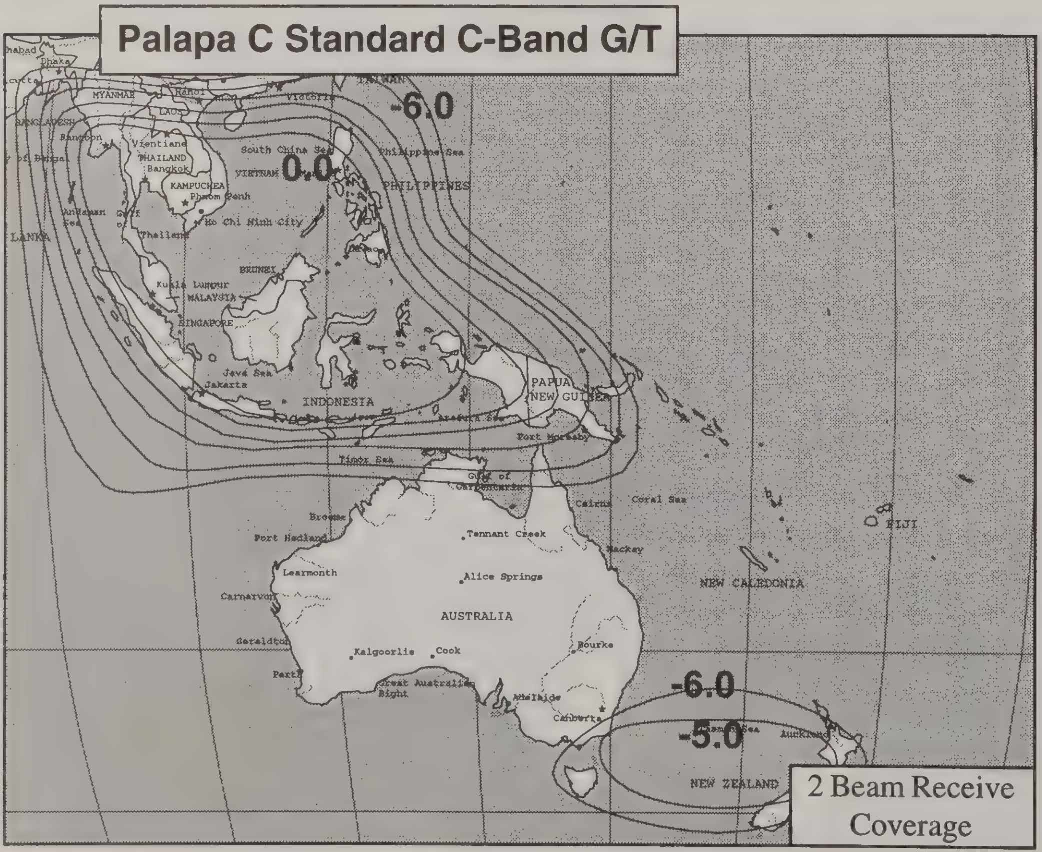


Palapa C Standard Extended C-Band (EIRP)



Palapa C Standard C-Band G/T

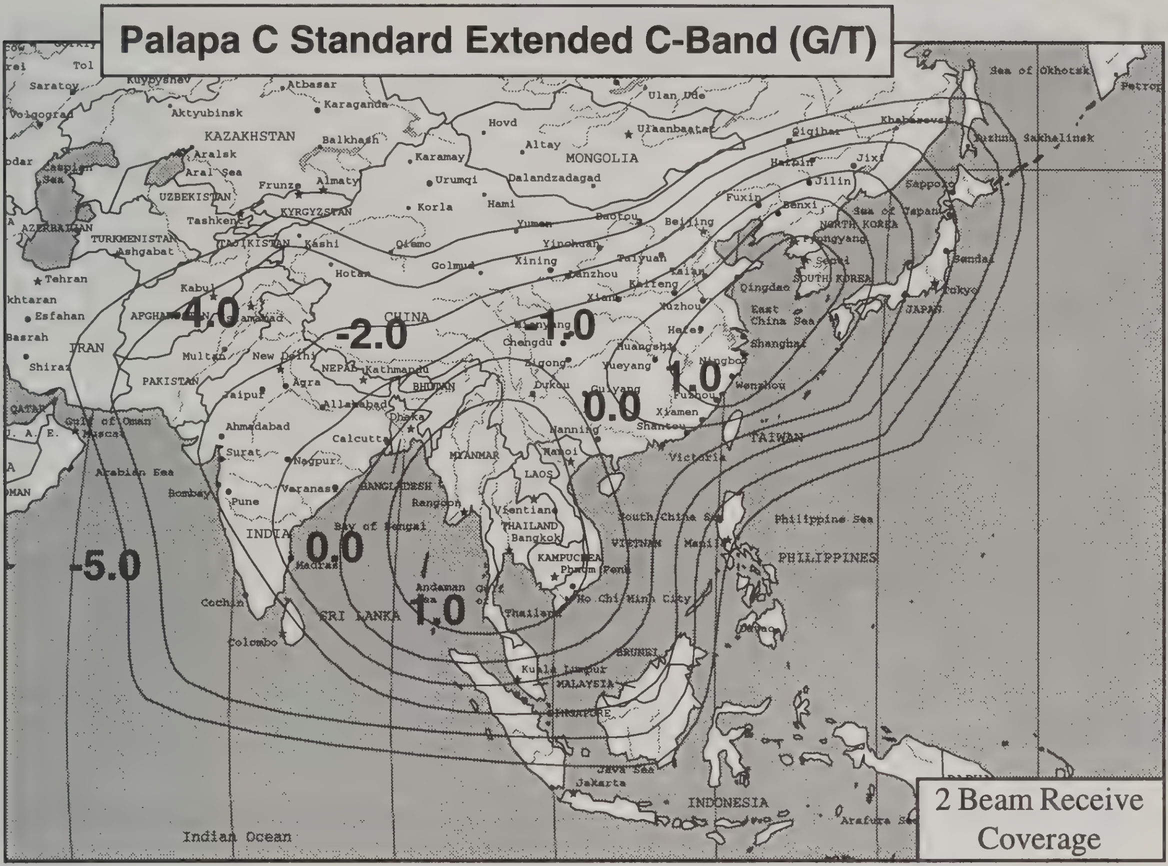
1 Beam Receive Coverage



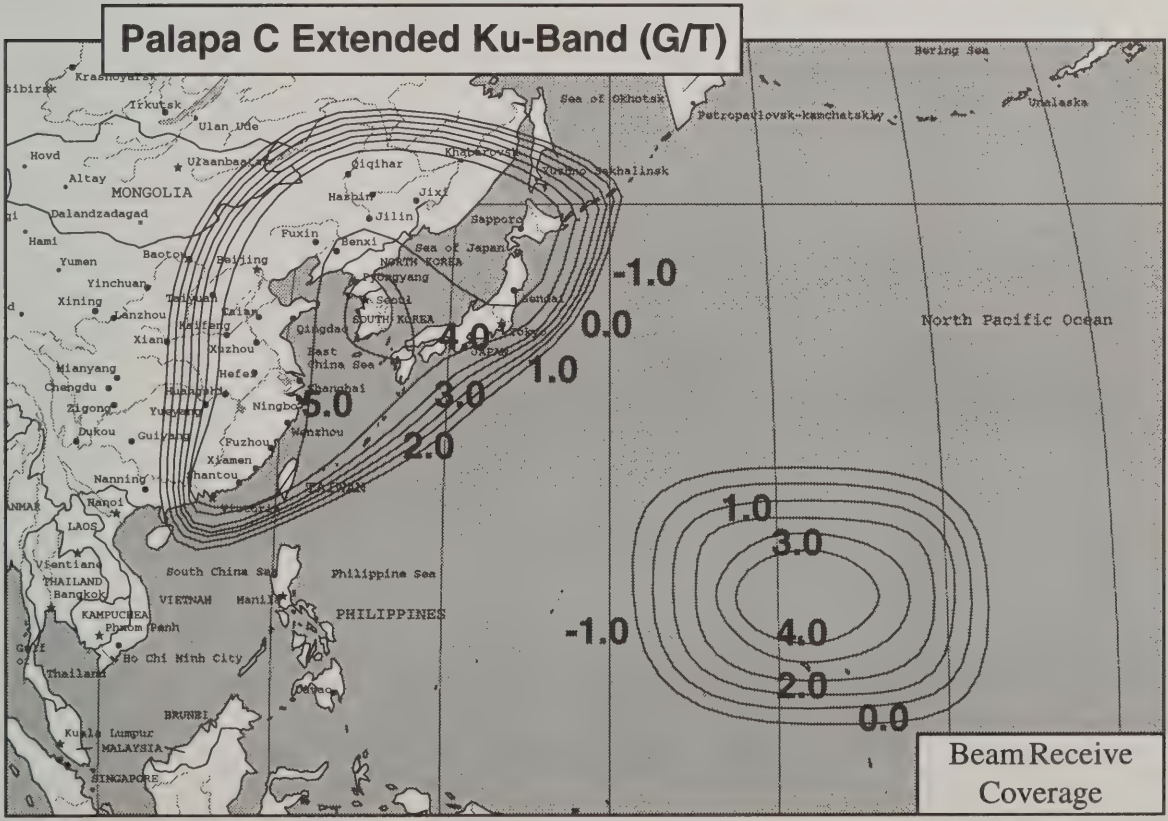
Palapa C Standard C-Band G/T

2 Beam Receive Coverage

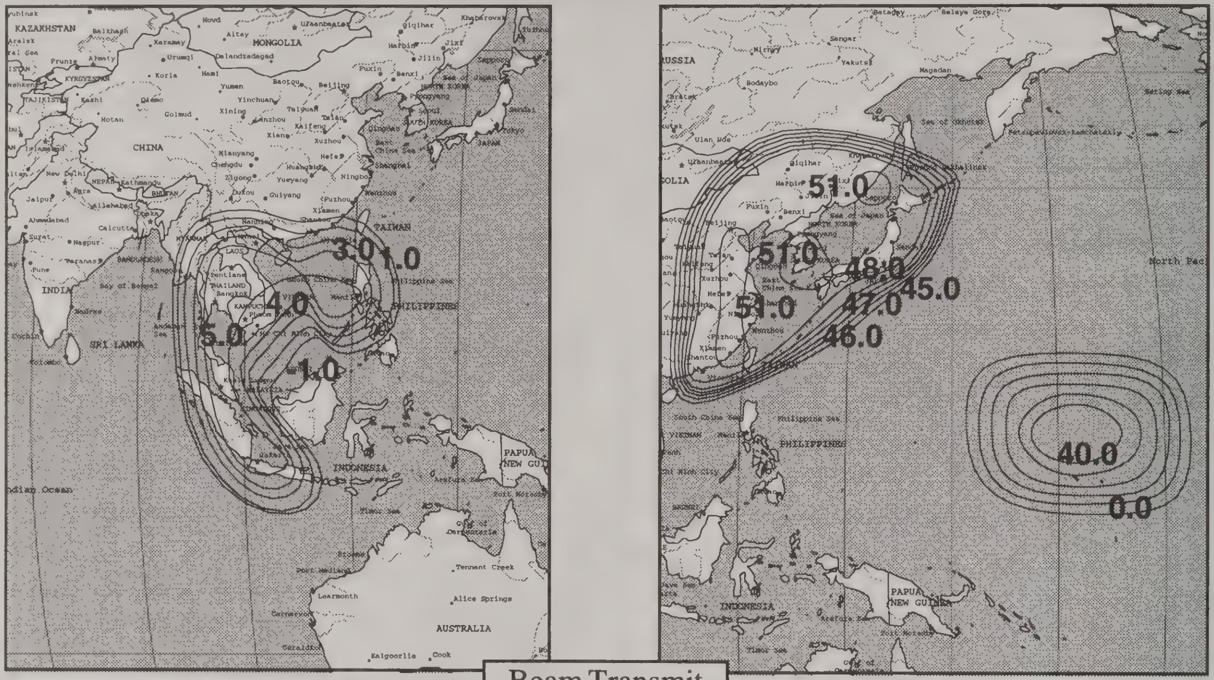
Palapa C Standard Extended C-Band (G/T)



Palapa C Extended Ku-Band (G/T)



Palapa C Extended Ku-Band (EIRP)



Beam Transmit Coverage

SPACECOM — SATELLITE COMMUNICATION SERVICES LTD.

Twin Towers II
35 Jabotinsky Street
Ramat Gan 52511
ISRAEL

Telephone: +972 3-613 4720
Facsimile: +972 3-613 4723
Corporate E-mail: spacecom@netvision.net.il

Booking Contact:

Ms. Mirit Hemy, Regional Marketing Manager

Overview:

AMOS is defined as a lightweight class GEO satellite dedicated to provide communication and broadcasting services for domestic and regional use. AMOS-1 was launched in May 1996 and is positioned at 356°E. AMOS-2 will be launched by mid-1998.

Services Offered:

- Communication and broadcasting services

AMOS SYSTEM At A Glance

- Satellite name: AMOS-1, 356°E (4°W)
- Spacecraft data:
  - Area of coverage: Middle East and central Europe
  - Mass (in orbit): 610 kg
  - Primary power (EOL): 1,140 W
  - Eclipse protection: full
  - Stabilization: 3-axis
  - Launch date: May 15, 1996
  - Launch vehicle: Ariane 4
  - Expected lifetime: 11 years

  - Transponders:
    - Number: 7 active out of 9
    - Frequency band: Ku-band
    - Power output: 35 W each
    - Polarization: European beam: uplink - vertical; downlink - horizontal; Middle East beam: uplink - horizontal; downlink - vertical
    - G/T: 14 dB/K at beam center
    - Redundancy: 2
    - Broadcast frequencies: Uplink: 14.17 to 14.5 GHz, Downlink: 11 to 11.45 GHz (European beam); Uplink: 14.0 to 14.5 GHz, Downlink: 10.95 to 11.2 GHz, 11.45 to 11.7 GHz (Middle East beam)

  - Single carrier saturation flux density: -99 dBW/m maximum, -74 dBW/m minimum

  - Manufacturer: Israel Aircraft Industries -- Electronic Group

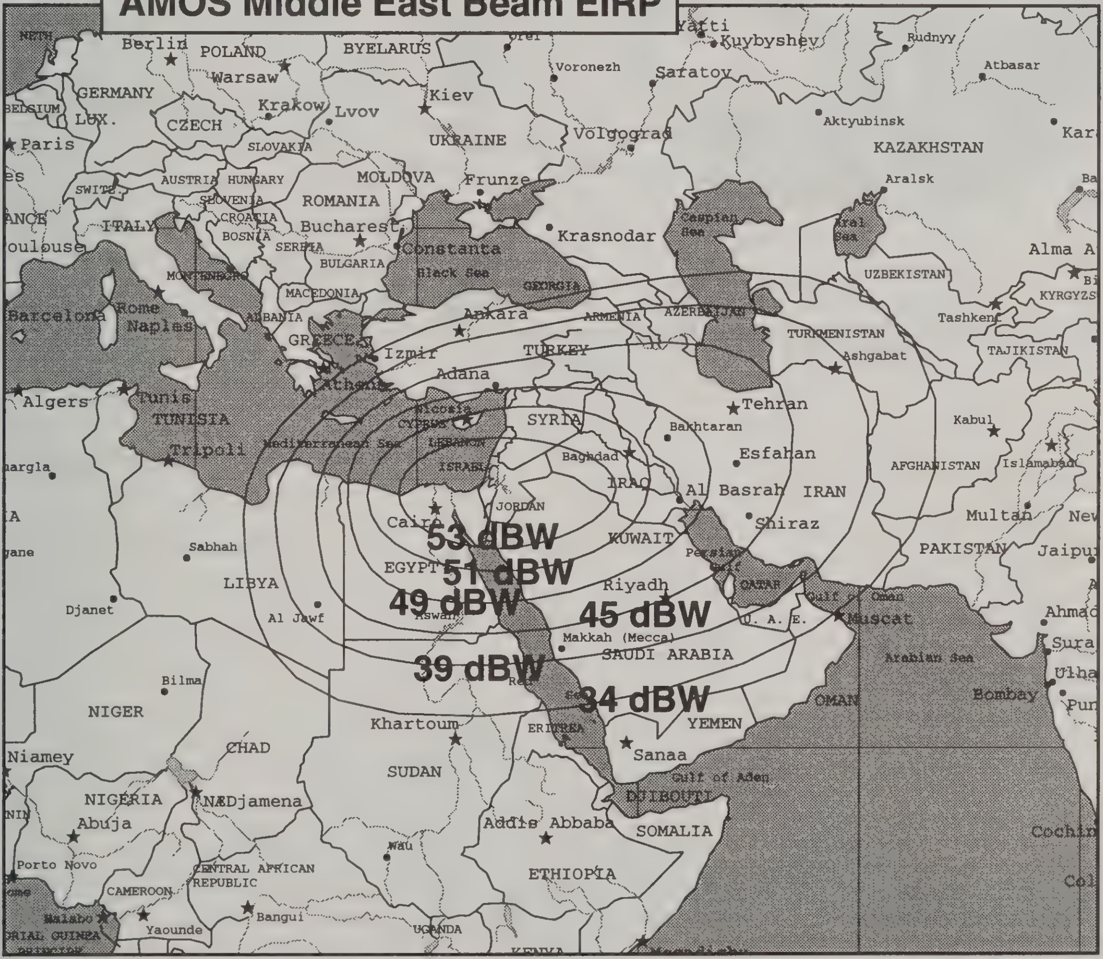
AMOS-I

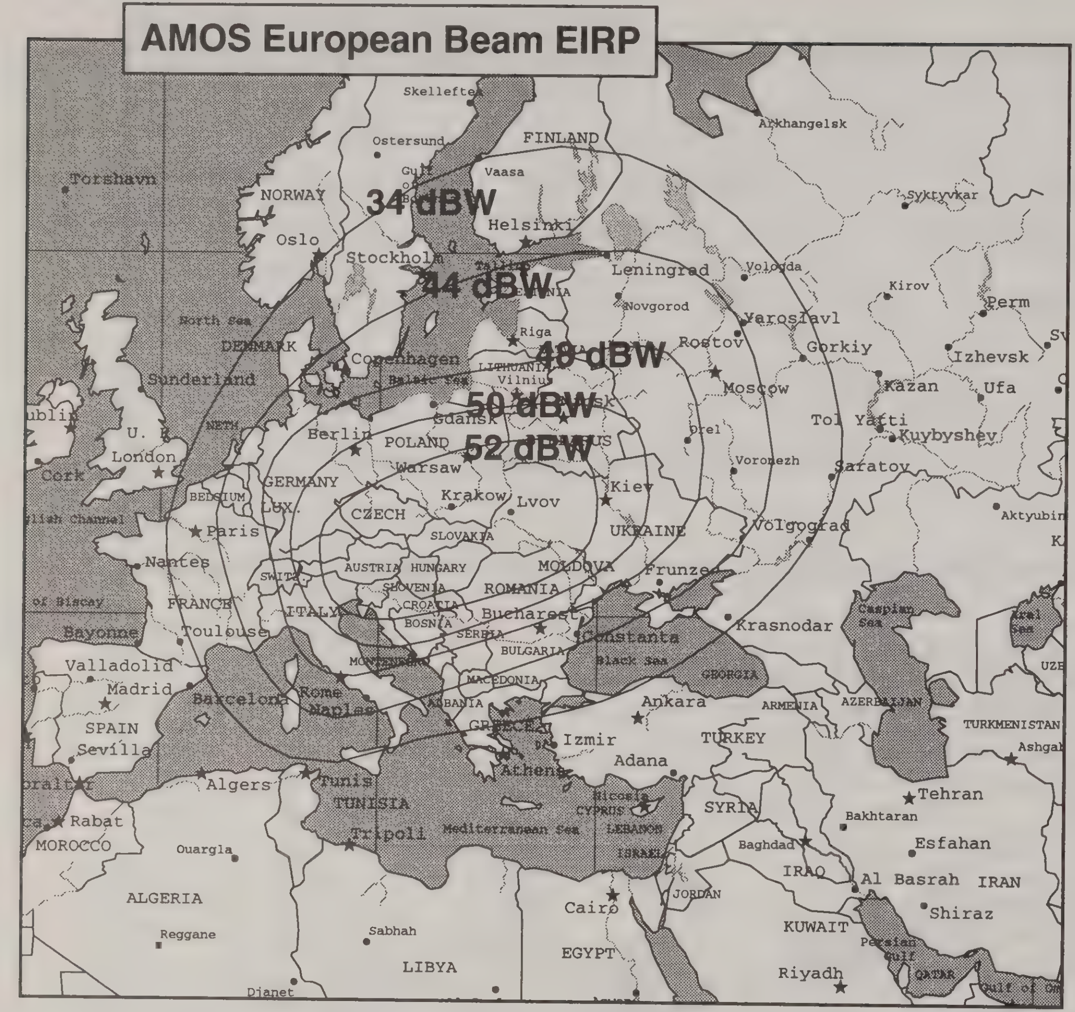
Orbital location:	356ºE (4°W)
Launch:	May 15, 1996, Ariane 4
Expected lifetime:	11 years
Expected end of life:	2007

Antennas beam coverage overview:

Ku-band:	Middle East and central Europe

AMOS Middle East Beam EIRP





AMOS European Beam EIRP

NUOVA TELESPAZIO S.P.A.

Via Tiburtina 965
I-00156 Rome
ITALY

Telephone:	+39 6-40796250
Facsimile:	+39 6-40793631
Telex:	620424

Booking Contact:

Luigi Ruspantini, Commercial Manager

Overview:

Operates Italsat, a domestic fixed-service satellite system, providing data, digital telephony, electronic mail and 8 Mbps/s videoconferencing. Italsat 1 is operated by Telespazio on behalf of the Italian telecommunications authority Azienda di Stato per i Servizi Telefonici, Rome. The satellite was originally contracted by the Italian Space Agency (ASI), which managed it during its first two years of operation (1991-1992).

Services Offered:

- Data
- Digital telephony
- Electronic mail
- 8 Mbps/s videoconferencing
- 20 to 30 GHz band applications; experimental applications in 40 to 50 GHz band. Spot beams plus global coverage

Satellite Control Network:

Satellite control:	Fucino
TT&C stations:	Fucino/Larico/Scanzano

ITALSAT SYSTEM At A Glance

Satellite name:	Italsat 1, 13.2°E; Italsat 2, 3°E
Spacecraft data:	
Mass (in orbit, BOL):	890 kg
Primary power (EOL):	1,400 W
Stabilization:	3-axis
Launch date:	January 1991 (Italsat 1), August 8, 1996 (Italsat 2)
Expected lifetime:	7 years
Transponders:	
Number:	9 (6 multi-beam, 3 national)
Power output:	21 W TWTA
Uplink frequency:	27.5-30.0 GHz
Downlink frequency:	18.5-20.2 GHz
Polarization:	Linear
Bandwidth:	120 MHz (multi-beam), 40 MHz (national)
Manufacturer:	Alenia

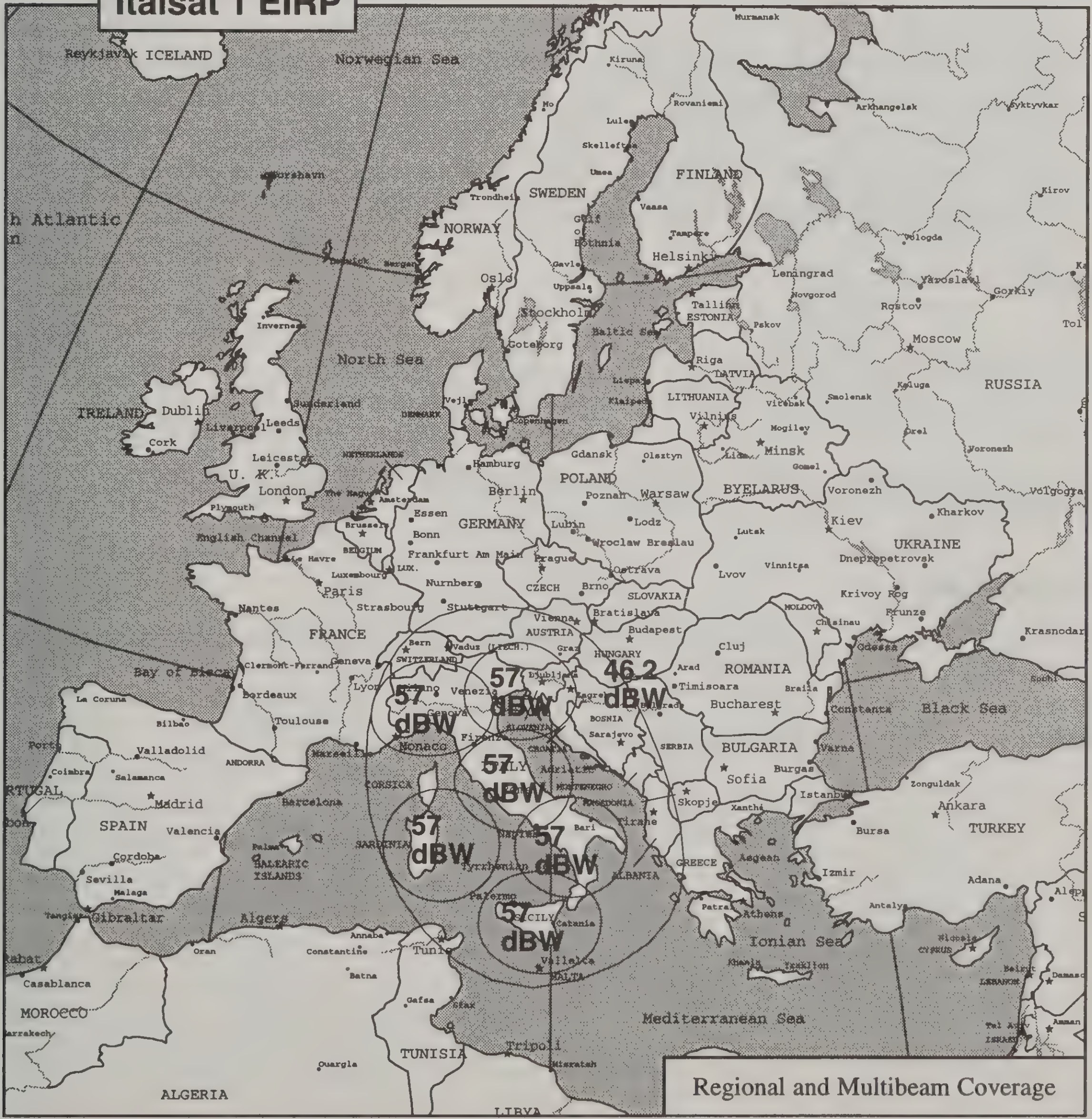
Italsat 1

Orbital location:	13.2°E
Launch:	January 1991, Ariane
Expected lifetime:	7 years
Expected end of life:	1998

Antennas beam coverage overview:

Ka-band, Ku-band, S-band:	Italy

Italsat 1 EIRP



Regional and Multibeam Coverage

JAPAN SATELLITE SYSTEMS INC.
(JSAT)

Toranomon 17 Mori Building, 5F
1-26-5 Toranomon
Minato-ku, Tokyo 105
JAPAN

Telephone:	+81 33-5511-7778
Facsimile:	+81 33-3597-0601
Web Site Address:	www.iijnet.or.jp/jsat/

Booking Contact:

Maki Soto, Corporate Communications Staff

Overview:

Operates the JCSAT satellite system, providing communications services to the Japanese industry. On August 17, 1993, Japan Communications Satellite Company Inc. (JCSAT) merged with Satellite Japan Corporation, creating Japan Satellite Systems Inc. (JSAT). The JCSAT satellite system names remain unchanged. JCSAT-4 was launched February 19, 1997. Hughes is scheduled to deliver the JCSAT-5 satellite in November 1997 and the JCSAT-6 satellite in May 1998.

Services Offered:

- Data transmission and broadcast
- Video program distribution to CATV and network TV stations
- Telephony
- Videoconferencing, remote printing, high-speed facsimile transmission, satellite newsgathering

Satellite Control Network:

Satellite control:	Yokohama
TT&C stations:	Yokohama; Gunma Prefecture (backup)

JCSAT SYSTEM At A Glance

Satellite name:	JCSAT-1, 150°E*; JCSAT-2, 154°E; JCSAT-3, 128°E; JCSAT-4, 124°E; JCSAT-5 [to be launched]; JCSAT-6 [to be launched]
Spacecraft data:	
Mass (in orbit):	1,376 kg
Primary power (EOL):	2,200 W
Stabilization:	JCSAT-1 and -2: spin; JCSAT-3: body-stabilized
Launch date:	March 6, 1989 (1); January 1990 (2); August 28, 1995 (3); February 19, 1997 (4); November 1997 (5); May 1998 (6)
Launch vehicle:	Ariane 4 (1); Titan III (2); Atlas IIAS (3, 4 and 6)
Expected lifetime:	8.5 years (1); 10 years (2); 12 years (3)
Transponders:	
Number:	32 (1, 2 and 6); 28 Ku-band, 12 C-band (3)
Power output:	JCSAT-1 and -2: 20 W TWTA; JCSAT-3: 60 W Ku-band, 34 W C-band; JCSAT-6: 70 W
Polarization:	Linear
Redundancy:	5:4
Single carrier saturation flux density:	-90 dBW/sq.m.
Manufacturer:	Hughes Electronics Corporation

*Deorbited

JCSAT Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	27	50	14.016	12.268
2	H	27	50	14.031	12.283
3	V	27	50	14.046	12.298
4	H	27	50	14.061	12.313
5	V	27	50	14.076	12.328
6	H	27	50	14.091	12.343
7	V	27	50	14.106	12.358
8	H	27	50	14.121	12.373
9	V	27	50	14.136	12.388
10	H	27	50	14.151	12.403
11	V	27	50	14.166	12.418
12	H	27	50	14.181	12.433
13	V	27	50	14.196	12.488
14	H	27	50	14.211	12.463
15	V	27	50	14.226	12.478
16	H	27	50	14.241	12.493
17	V	27	50	14.256	12.508
18	H	27	50	14.271	12.523
19	V	27	50	14.281	12.538
20	H	27	50	14.301	12.553
21	V	27	50	14.316	12.568
22	H	27	50	14.331	12.583
23	V	27	50	14.346	12.598
24	H	27	50	14.361	12.613
25	V	27	50	14.376	12.628
26	H	27	50	14.391	12.643
27	V	27	50	14.406	12.658
28	H	27	50	14.421	12.673
29	V	27	50	14.436	12.688
30	H	27	50	14.451	12.703
31	V	27	50	14.466	12.718
32	H	27	50	14.481	12.733

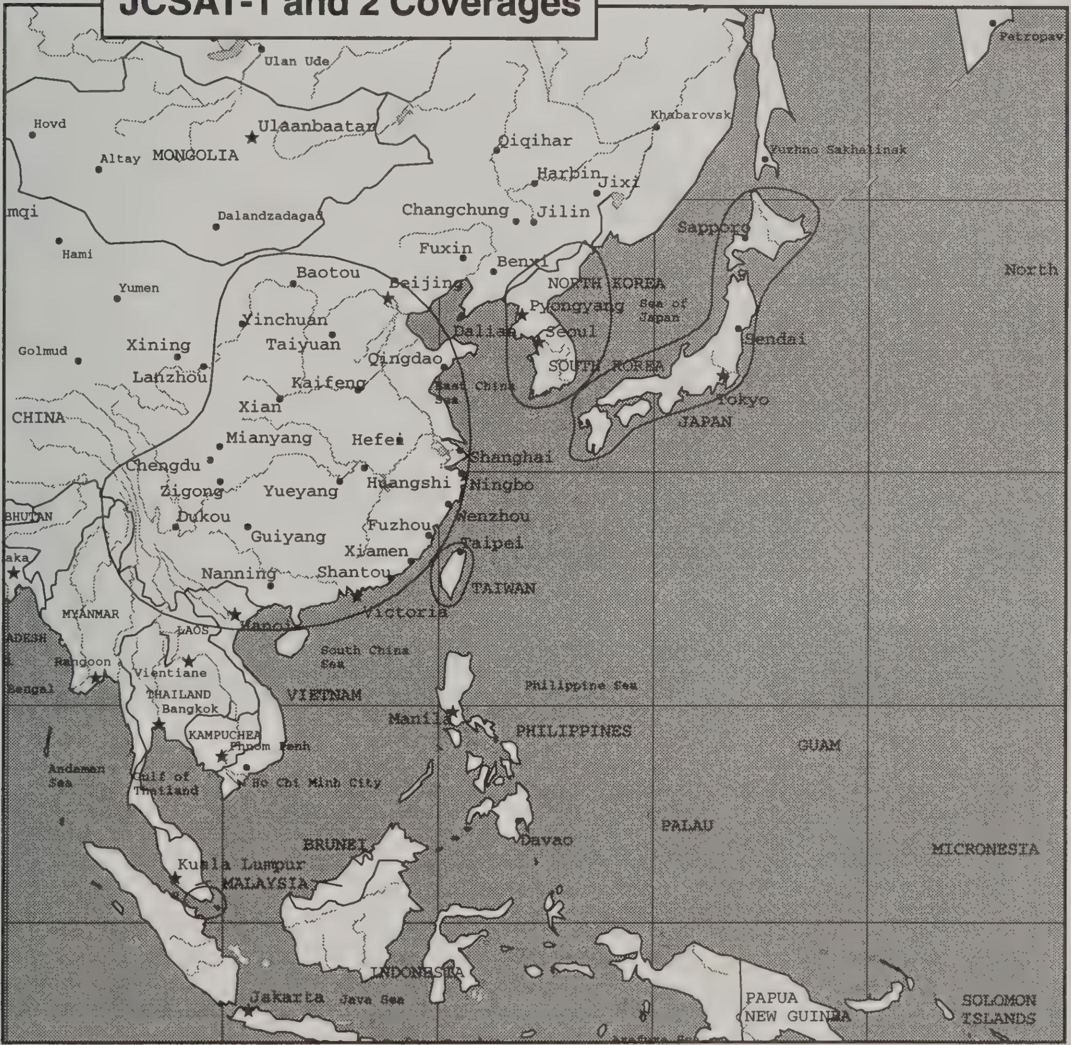
JCSAT-1 and 2

Orbital position:	150°E (JCSAT-1), 154°E (JCSAT-2)
Launch:	March 6, 1989, Ariane-4 (JCSAT-1) January 1990, Titan III (JCSAT-2)
Expected lifetime:	10 years
Expected end of life:	1997 (JCSAT-1), 2000 (JCSAT-2)

Antennas beam coverage overview:

Ku-band:	Japan, China, Korea, Taiwan, Hong Kong, Singapore, and Hawaii

JCSAT-1 and 2 Coverages



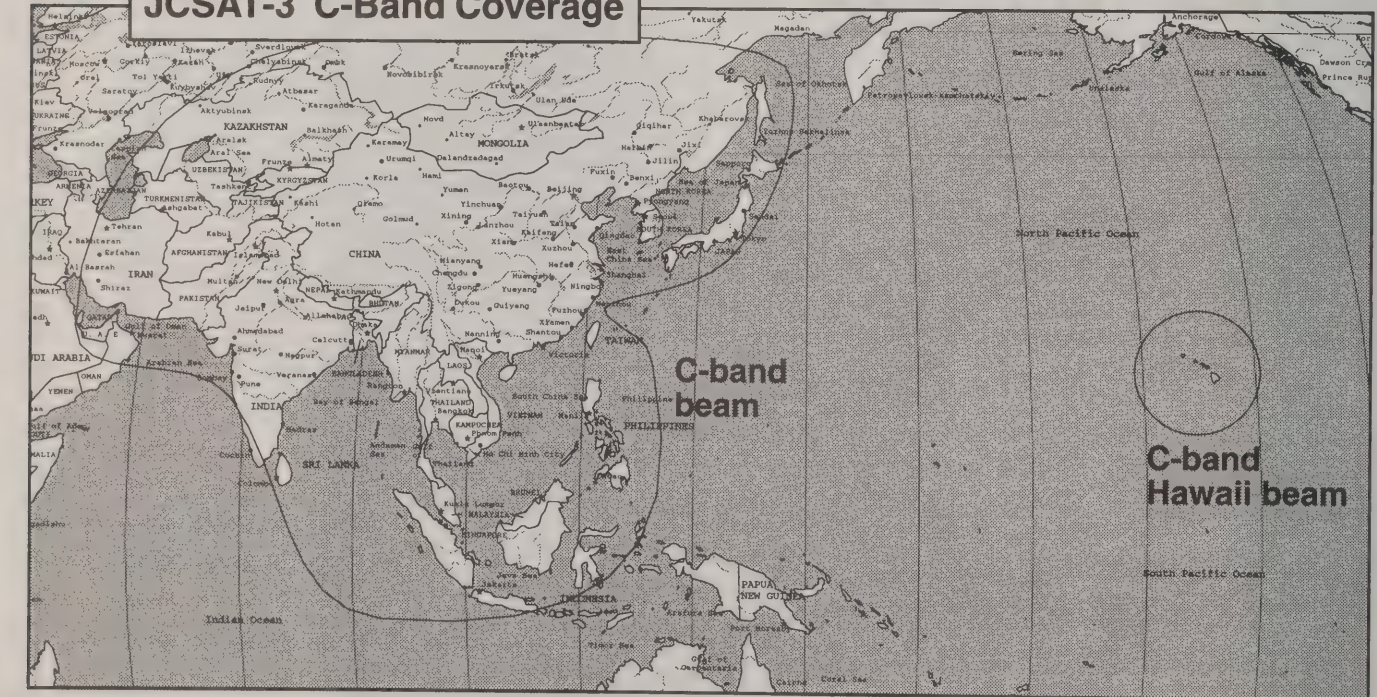
JCSAT-3

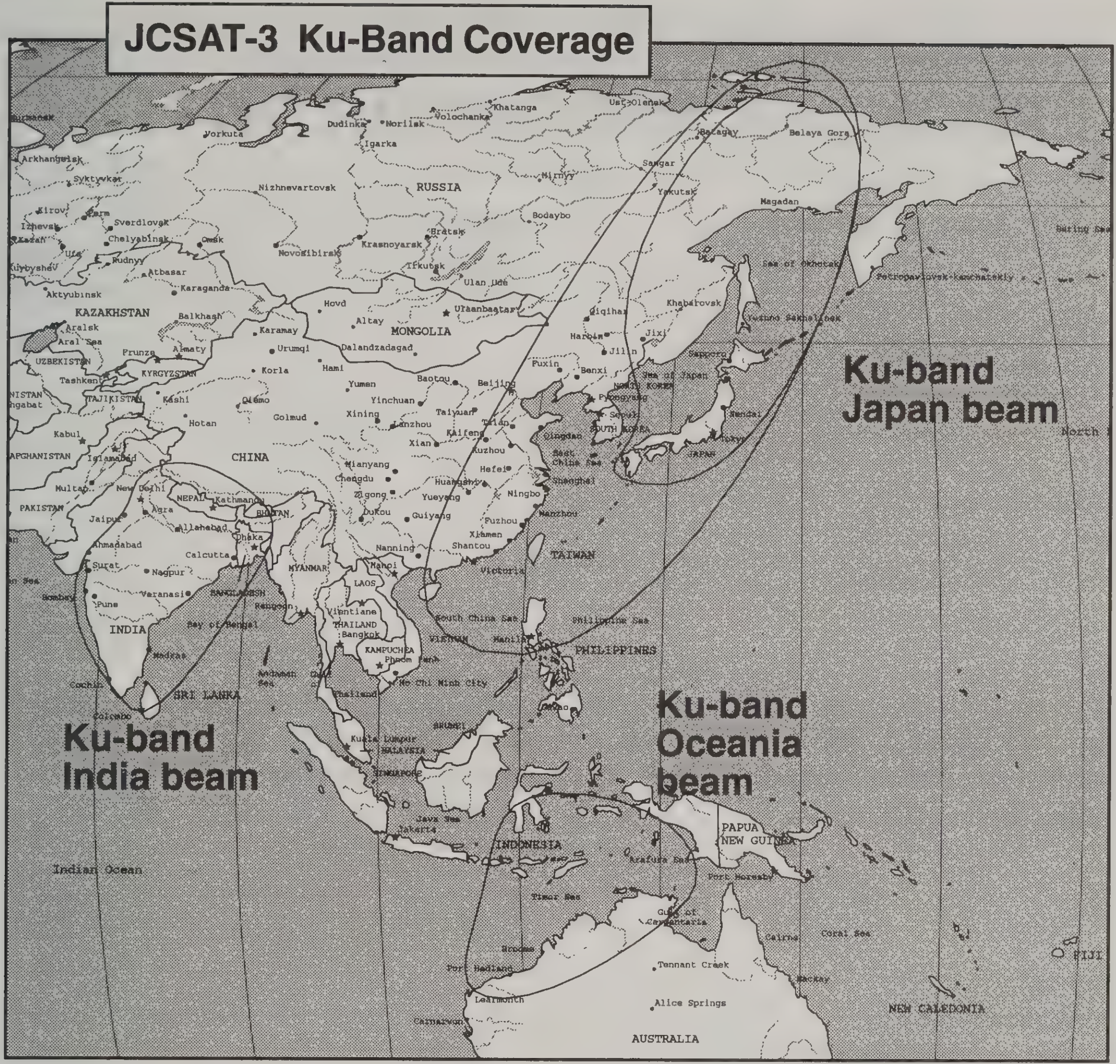
Orbital position:	128°E
Launch:	August 28, 1995
Expected lifetime:	12 years
Expected end of life:	2007

Antennas beam coverage overview:

Ku-band:	Japan (main islands), Asia, India, Australia
C-band:	Asia, Hawaii

JCSAT-3 C-Band Coverage





JCSAT-3 Ku-Band Coverage

NIPPON TELEGRAPH AND TELEPHONE CORPORATION (NTT)

Shin-Nikko Building, 10-1, Toranomon 2-chome
Minato-ku
Tokyo 105
JAPAN

Telephone:	+81 3-5563-7252
Facsimile:	+81 3-5563-7088
Telex:	2225300 NTT HQJ

Contacts:

Haruo Yamaguchi, Chairman
Masashi Kojima, President
Yoshiyuki Yasuda, Senior Engineerr

Overview:

The C-, Ka-, Ku-, and S-band N-Star A satellite was successfully launched on August 29, 1995. N-Star B was successfully launched on February 5, 1996. The satellites provide fixed satellite service (FSS) and mobile satellite service (MSS).

Services Offered:

- Telecommunications
- Data communications
- Disaster relief and mobile phone services

N-STAR SYSTEM At A Glance

Satellite name:	N-Star A, 132°E; N-Star B, 132°E
Spacecraft data:	
Area of coverage:	Japanese islands and territorial waters
Mass (in orbit):	1820 kg
Stabilization:	3-axis
Launch date:	August 29, 1995 (A); February 5, 1996 (B)
Launch vehicle:	Ariane 42P (A); Ariane 44P (B)
Expected lifetime:	10 years
Transponders:	
Number:	26
Frequency bands:	C-, Ka-, Ku-, S-band
Manufacturer:	Space Systems/Loral

SPACE COMMUNICATIONS CORPORATION (SCC)

2-8 Higashi-Shinagawa
2-chome
Shinagawa-ku, Tokyo 140
JAPAN

Telephone:	+81 3-5462-1370
Facsimile:	+81 3-5462-1391
Web Site Address:	www.superbird.co.jp/default.html

Booking Contact:

Katsutake Matsuoka, Director of International Marketing and Sales Department

Overview:

Operates the Superbird communications satellites and provides communications services.

Services Offered:

- VSAT service
- DirecPC service (tentative name; this service will start in early 1997)

SUPERBIRD SYSTEM At A Glance

Satellite name:	Superbird A, 158°E; Superbird B, 162°E; Superbird C, 144°E (to be launched)
Spacecraft data:	
Mass (in orbit):	1,550 kg (Superbird A, B), 1,900 kg (Superbird C)
Primary power (EOL):	3,800 W (Superbird A, B), 4,500 W (Superbird C)
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	December 1992 (Superbird A), February 26, 1992 (Superbird B), June 1997 (Superbird C)
Launch vehicle:	Ariane 4 (Superbird A, B), Atlas IIAS (Superbird C)
Expected lifetime:	10 years (A, B); 13 years (C)
Transponders:	
Number:	29 (Superbird A), 33 (Superbird B), 24 (Superbird C)
Power output:	50 W TWTA (Ku-band), 29 W TWTA (Ka-band) (Superbird A, B); 90 W TWTA (Superbird C)
Polarization:	Linear (Ku-band), Circular (Ka-band) [Superbird A, B]; Linear (Superbird C)
Redundancy:	4:2 (Ku-band), 2:1 (Ka-band) [Superbird A, B]; 30:24 LTWTAs (Superbird C)
G/T:	6 dB/K (Superbird A, B); 13.4 dB/K (Japan), 8.2 dB/K (NE Asia), 7.0 dB/K (SE Asia), -1.1 dB/K (Hawaii), 7.9 dB/K (Spot) [Superbird C]
Single carrier saturation flux density:	-90 dBW/m² (Ku-band), -87 dBW/m² (Ka-band) [Superbird A, B]; -107 dBW/m2 (Japan), -100 dBW/m2 (NE and SE Asia, Spot) [Superbird C]
Manufacturer:	Space Systems/Loral (A, B), Hughes Space and Communications (C)

Superbird A & B Transponder Frequency Plan

Tr.#	Pol.*	BW(MHz)	EIRP(dBW)**	Uplink(GHz)	Downlink(GHz)
T1	LHC	100	52.5	27.625	17.825
T2	LHC	100	52.5	27.745	17.945
T3	LHC	100	52.5	27.865	18.065
N1	LHC	100	52.5	28.345	18.545
N2	LHC	100	52.5	28.465	18.665
N3	LHC	100	52.5	28.585	18.785
N4	LHC	100	52.5	28.705	18.905
N5	LHC	100	52.5	28.825	19.025
N6	LHC	100	52.5	28.945	19.145
N7	LHC	100	52.5	29.065	19.265
1	H	36	54.0	14.020	12.290
2	H	36	54.0	14.060	12.330
3	H	36	54.0	14.100	12.370
4	H	36	54.0	14.140	12.410
5	H	36	54.0	14.180	12.450
6	H	36	54.0	14.220	12.490
7	H	36	54.0	14.260	12.530
8	H	36	54.0	14.300	12.570
9	H	36	54.0	14.340	12.610
10	H	36	54.0	14.380	12.650
11	H	36	54.0	14.420	12.690
12	H	36	54.0	14.460	12.730
13	V	36	54.0	14.040	12.310
14	V	36	54.0	14.080	12.350
15	V	36	54.0	14.120	12.390
16	V	36	54.0	14.160	12.430
17	V	36	54.0	14.200	12.470
18	V	36	54.0	14.240	12.510
19	V	36	54.0	14.280	12.550
20	V	36	54.0	14.320	12.590
21	V	36	54.0	14.360	12.630
22	V	36	54.0	14.400	12.670
23	V	36	54.0	14.440	12.710

* Polarization for uplink beam
** Peak EIRP

Superbird C Transponder Frequency Plan

Tr.#	Pol.*	BW(MHz)	EIRP(dBW)**	Uplink(GHz)	Downlink(GHz)
1	V	54***	57.2	14.050	12.320
2	V	54***	57.2	14.110	12.380
3	V	36	57.2	14.160	12.430
4	V	36	57.2	14.200	12.470
5	V	27	57.2	14.253	12.523
6	V	27	57.2	14.283	12.553
7	V	27	57.2	14.313	12.583
8	V	27	57.2	14.343	12.613
9	V	27	57.2	14.373	12.643
10	V	27	57.2	14.403	12.673
11	V	27	57.2	14.433	12.703
12	V	27	57.2	14.463	12.733
13	H	54***	57.6	14.050	12.320
14	H	54***	57.6	14.110	12.380
15	H	36	57.6	14.160	12.430
16	H	36	57.6	14.200	12.470
17	H	27	57.6	14.238	12.508
18	H	27	57.6	14.268	12.538
19	H	36	57.6	14.298	12.568
20	H	27	57.6	14.328	12.598
21	H	27	57.6	14.358	12.628
22	H	27	57.6	14.398	12.658
23	H	27	57.6	14.418	12.688
24	H	27	57.6	14.448	12.718

* Polarization for uplink beam

** Peak EIRP for Japan beam

*** Two successive 54 MHz transponders can be used as a 114 MHz 180W channel

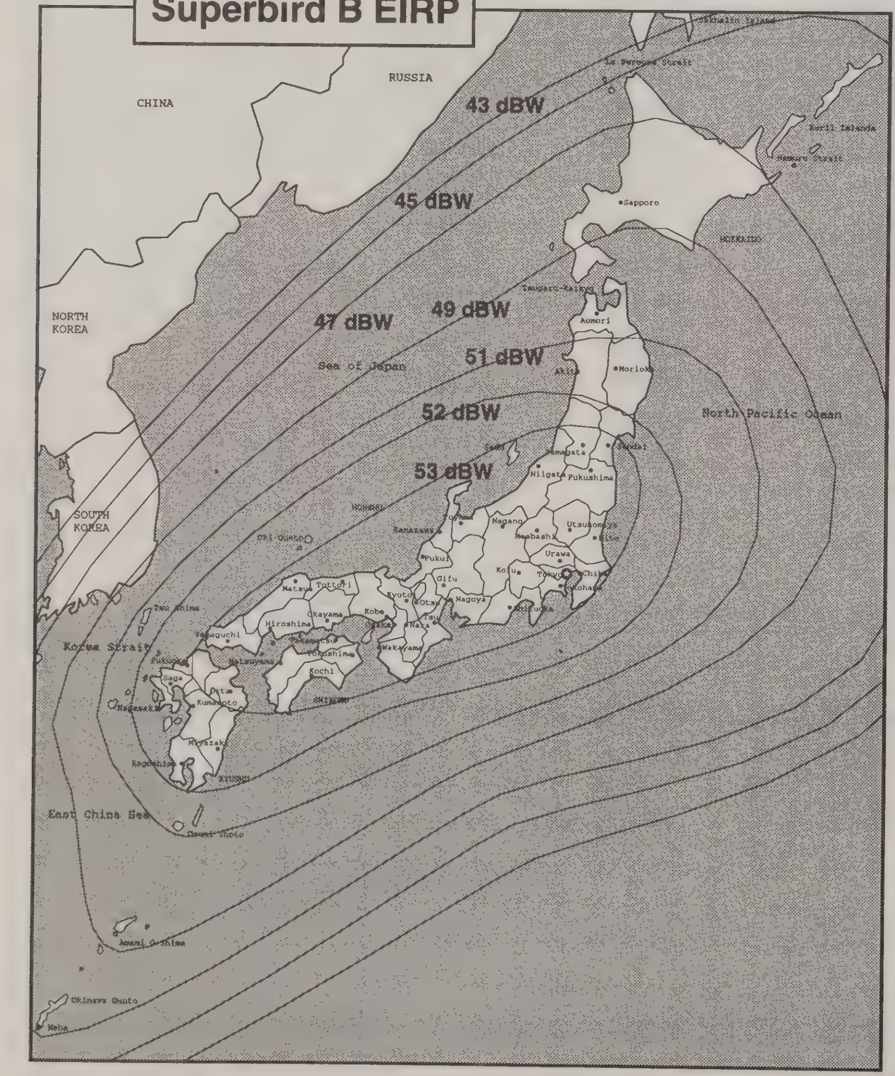
Superbird A and B

Orbital location:	158°E (A), 162°E (B)
Launch:	December 1992, Ariane (A), February 26, 1992, Ariane (B)
Expected lifetime:	10 years
Expected end of life:	2002

Antennas beam coverage overview:

Ku-band:	Japan (A and B)
Ka-band:	Japan, Taiwan, Korea (A), Japan, Tokyo spot beam (B)

Superbird B EIRP



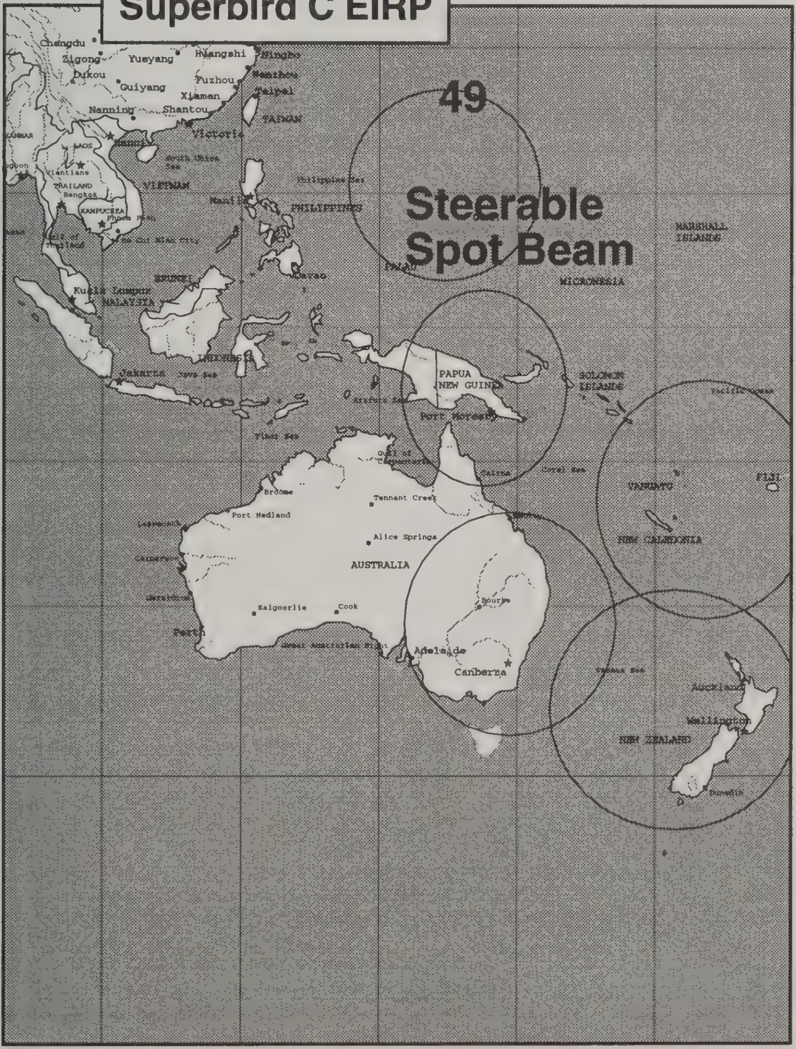
Superbird C

Orbital location:	144°E
Launch:	June 1997 (to be launched)
Expected lifetime:	10 years (minimum)
Expected end of life:	2007

Antennas beam coverage overview:

Ku-band:	Japan, Northeast and Southeast Asia, Hawaii, steerable spot

Superbird C EIRP



TAO

31-19, Shiba 2-chome, Minato-ku
Tokyo 105
JAPAN

Telephone:	+81 3-3769-6811
Facsimile:	+81 3-3452-7600

Booking Contacts:

Shin-ichi Watanabe, Director of General Affairs Division
Masami Uemura, General Affairs Division Director

Overview:

TAO (formerly Telecommunications Satellite Corporation of Japan) is responsible for the operation and control of the BS (Yuri) and N-Star series satellites.

Services Offered:

- Operational control and management of N-Star A and B and BS-3a, 3b and 3n satellites in geostationary orbit
- Lease of the space segment of BS-3a and BS-3b

Satellite Control Network:

Satellite control:	Kimitsu, Chiba, Japan
TT&C stations:	Kimitsu, Chiba, Japan

BS3 YURI SYSTEM At A Glance

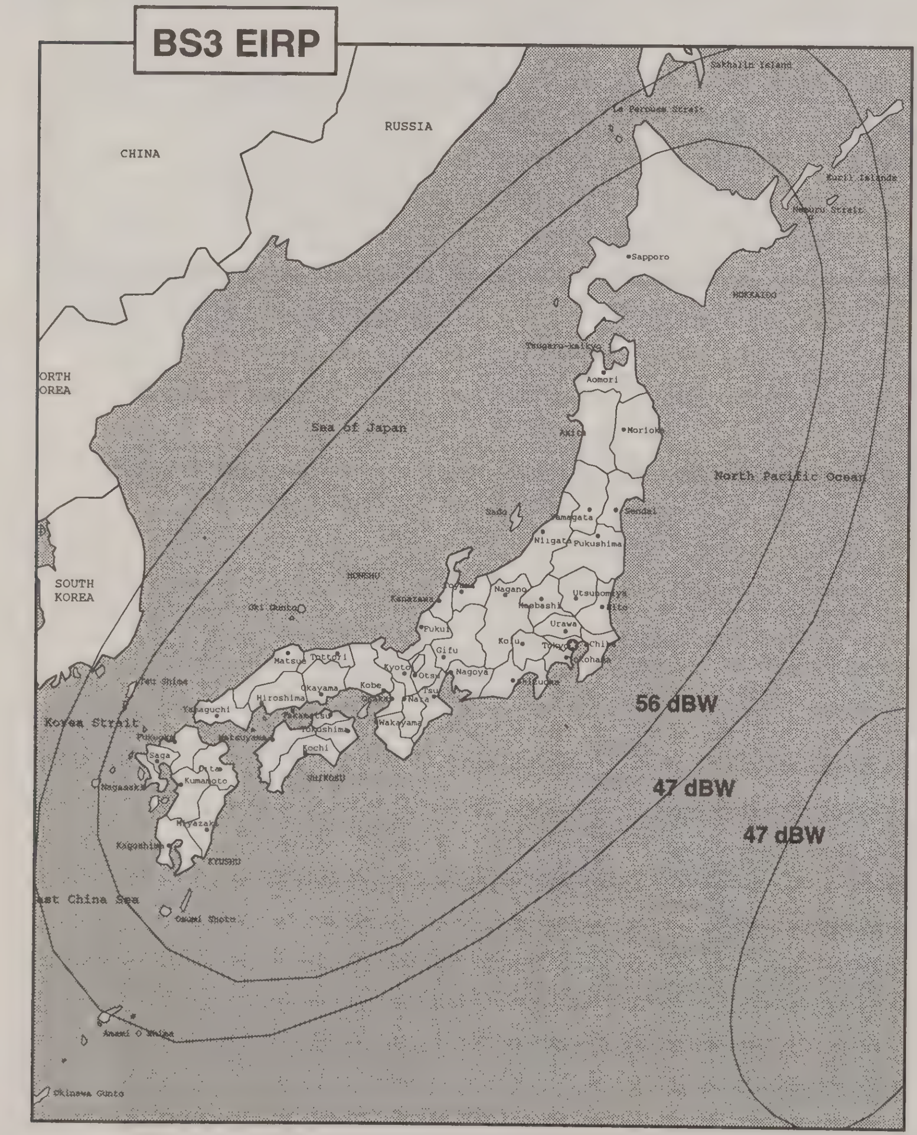
Satellite name:	BS3 Yuri-A, 110°E, collocated; BS3 Yuri-B, 110°E, collocated
Spacecraft data:	
Mass (in orbit):	550 kg
Primary power (EOL):	1,500 W
Eclipse protection:	Not operational during an eclipse
Stabilization:	3-axis
Launch date:	August 1990 (BS3 Yuri-A), August 1991 (BS3 Yuri-B)
Launch vehicle:	NASDA H-I
Expected lifetime:	7 years
Transponders:	
Number:	3
Power output:	120 W TWTA
Polarization:	circular
Redundancy:	2:1
EIRP:	55.5 dBW (Japanese mainland)
Broadcast frequencies:	12 GHz
Manufacturer:	NASDA

BS3

Orbital location:	110°E collocated (BS3 Yuri-A and BS3 Yuri-B)
Launch:	August 1990, NASDA H-I (BS3 Yuri-A); August 1991, NASDA H-I (BS3 Yuri-B)
Expected lifetime:	7 years
Expected end of life:	1997 (BS3 Yuri-A), 1998 (BS3 Yuri-B)

Antennas beam coverage overview:

Ku-band:	Japanese mainland



BS3 EIRP

MINISTRY OF COMMUNICATIONS (KOREA)

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Seoul 110-777
KOREA

Telephone: +82 42-860-4630
Facsimile: +82-42-860-6465

Contact:

Dr. Seon Jong Chung, Vice President of ETRI's Satellite Communications Division

Overview:

Operates the Koreasat satellite system. The satellites provides domestic satellite services (FSS and DBS) and public communications to South Korea.

Services Offered:

- DBS
- Video relay (CATV, SNG, business services)
- Digital trunking for inter-city communications
- Remote/rural area communications
- Wideband digital data
- VSAT

KOREASAT SYSTEM At A Glance

Satellite name: Koreasat-1, 116°E, collocated; Koreasat-2, 116°E, collocated

Spacecraft data:
- Area of coverage: South Korea
- Mass (in orbit): 652 kg (1)
- Primary power: 1,533 W
- Eclipse protection: NiH2 battery
- Stabilization: 3-axis
- Launch date: August 5, 1995 (Koreasat-1), January 14, 1996 (Koreasat-2)
- Launch vehicle: Delta II

- Expected lifetime: 10 years

- Transponders:
  - Number: 12 FSS, 3 BSS
  - Power output: 14 W TWTA (FSS), 120 W TWTA (BSS)
  - Uplink frequency: 14.0 -14.5 GHz, 14.5 -14.8 GHz (BSS)
  - Downlink frequency: 12.25 -12.75 GHz (FSS), 11.7-12.0 GHz (BSS)
  - Bandwidth: 36 MHz (FSS), 27 MHz (BSS)
  - Polarization: Linear (FSS), LHCP (BSS)
  - Redundancy: 12/16 (FSS), 3/6 (DBS)
  - EIRP (EOC): 50.2 dBW (FSS), 59.4 dBW (DBS)
  - G/T (EOC): 13.5 dB/K (FSS), 13.0 dB/K (BSS)

- Single carrier saturation flux density: -90 dBW/m^2 (FSS), -82 dBW/m^2 (DBS)

- Manufacturer: Matra Marconi Space U.K. and Lockheed Martin

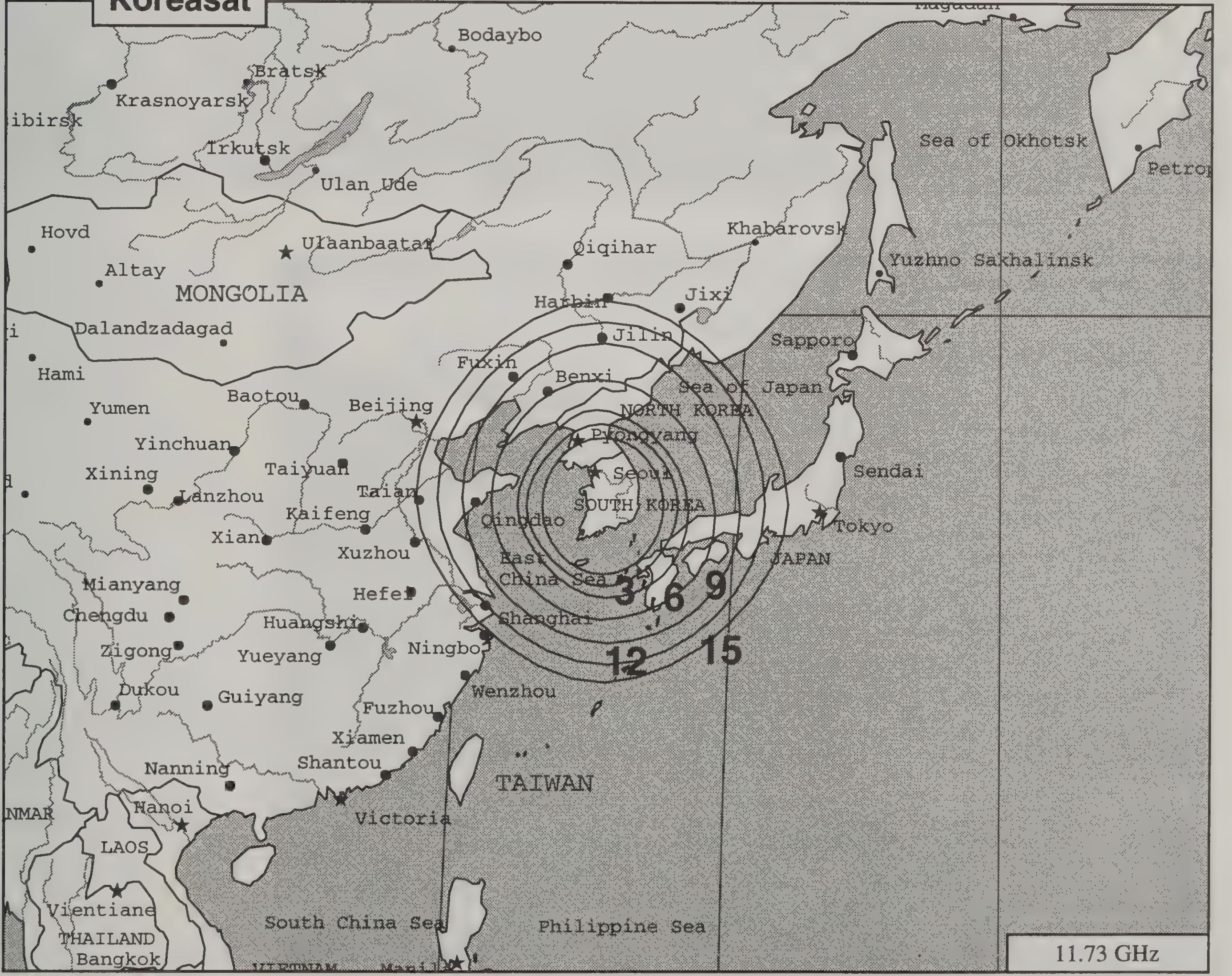
Koreasat

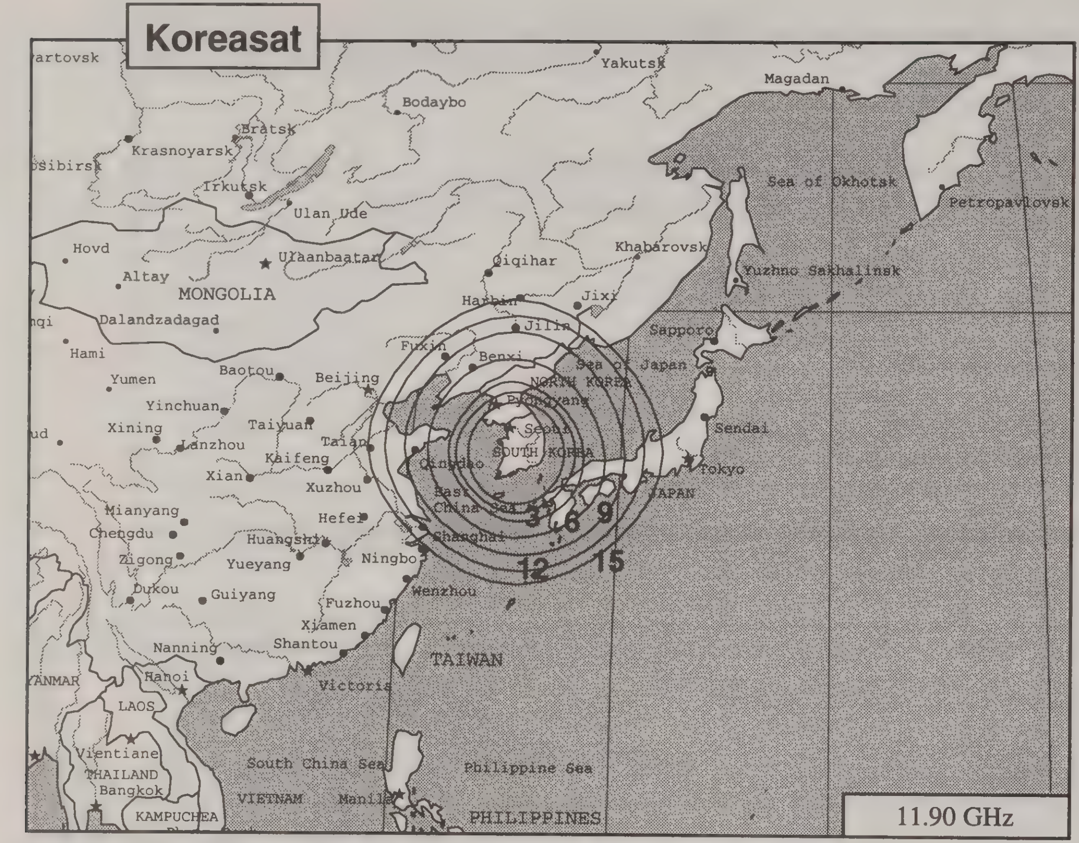
Orbital location: 116ºE (K1 and K2 collocated)
Launch date: August 1995 (K1), January 14, 1996 (K2)
Expected lifetime: 10 years
Expected end of life: 2005 (1), 2006 (2)

Antennas beam coverage overview:

Ku-band: South Korea

Koreasat




Koreasat
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Qiqihar
Khabarovsk
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Sea of Japan
Yumen
Baotou
Beijing
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Pyongyang
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Taiyuan
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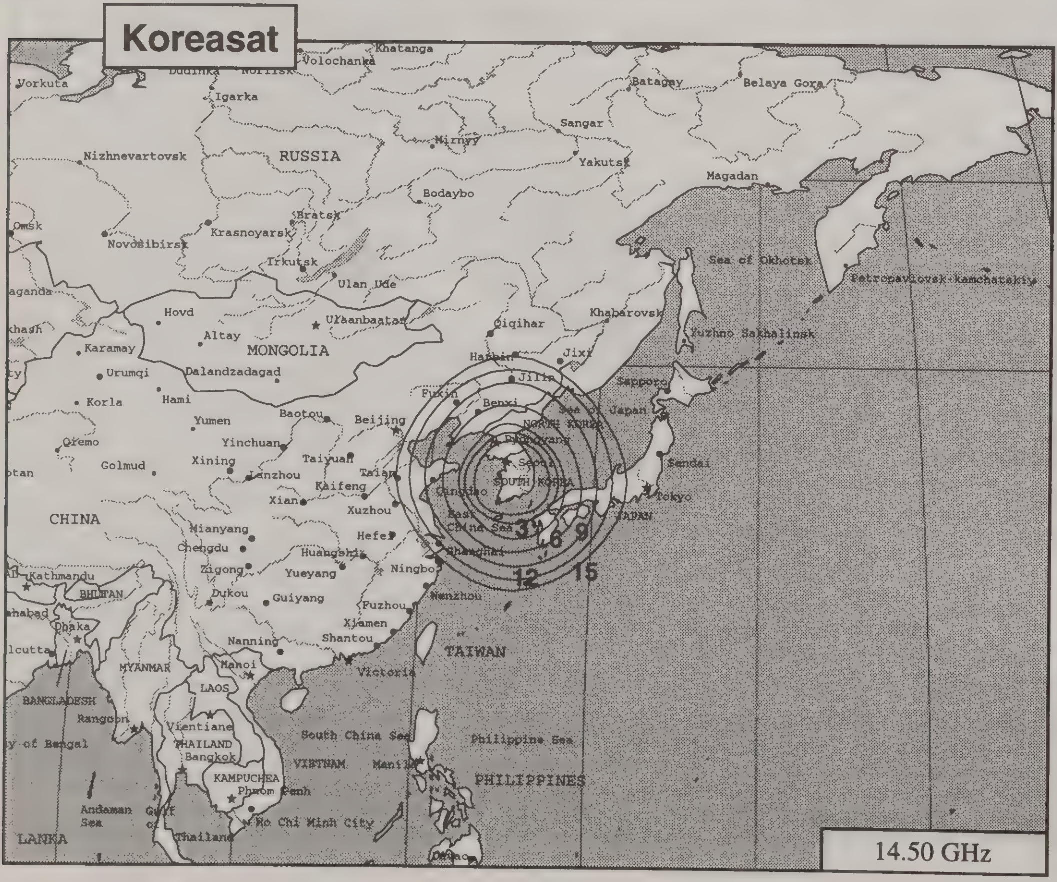
KAMPUCHEA
PHILIPPINES
11.90 GHz


Koreasat
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Yuzhno Sakhalinsk
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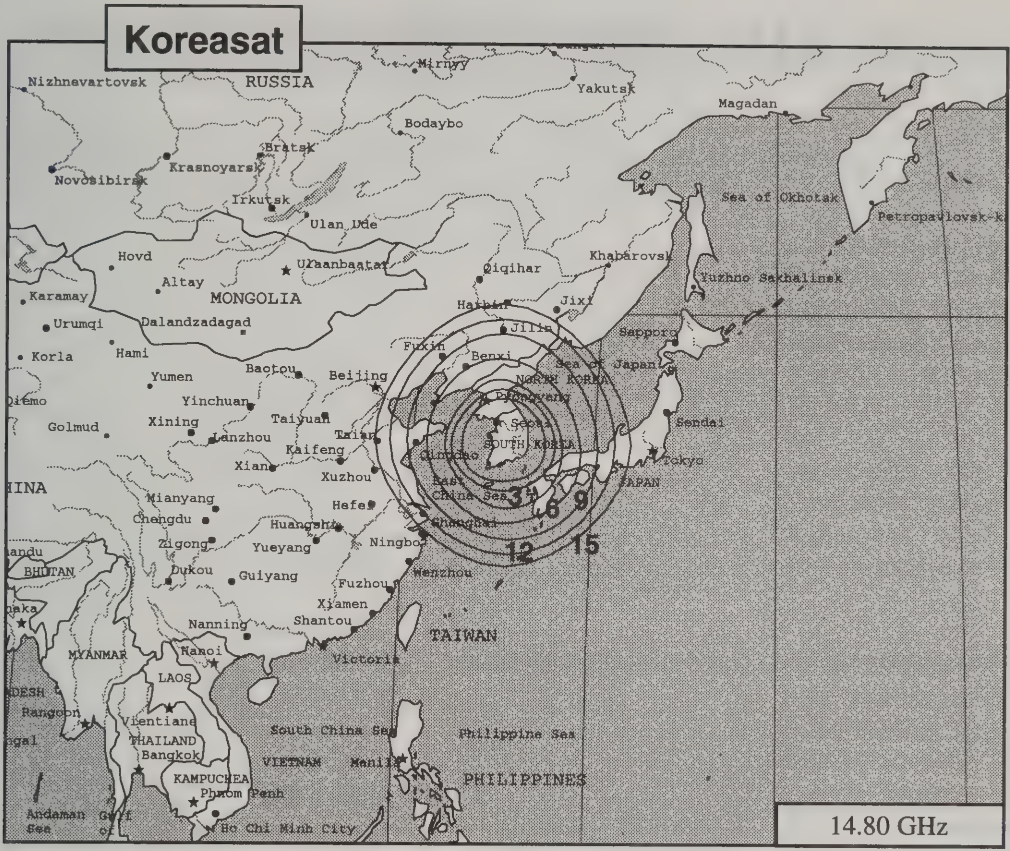
Andaman Sea
Gulf of Thailand
Ho Chi Minh City
LANKA
Davao
14.50 GHz


Koreasat
14.80 GHz
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Mirnyy
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Magadan
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Novosibirsk
Irkutsk
Ulan Ude
Sea of Okhotsk
Petropavlovsk-K
Hovd
Ulaanbaatar
Altay
Karamay
Urumqi
Dalandzadagad
Korla
Hami
Qiqihar
Khabarovsk
Yuzhno Sakhalinsk
Harbin
Jixi
Jilin
Sapporo
Fuxin
Benxi
Sea of Japan
Baotou
Beijing
Pyongyang
Seoul
Sendai
Yumen
Yinchuan
Qiemo
Golmud
Xining
Taiyuan
Lanzhou
Tianjin
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Tokyo
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Mianyang
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Zigong
Yueyang
Ningbo
Dukou
Guiyang
Wenzhou
Fuzhou
Xiamen
Nanning
Shantou
Hanoi
Victoria
Vientiane
Rangoon
South China Sea
Philippine Sea
Bangkok
Manila
Phnom Penh
Andaman Sea
Ho Chi Minh City

BINARIANG SDN BHD

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Booking Contact:

Agnes Yeow, Senior Executive

Contact:

Abdul Halim, Senior Manager of Measat Commercial Operations

Public Relations Contact:

Tengru Alina Ibrahina, Senior Manager of Corporate Communications

Overview:

Binariang Sdn Bhd launched its first satellite, Measat 1, on January 12, 1996. Measat 2 was launched November 13, 1996.

Services Offered:

- Broadcast television
- Satellite news gathering
- Digital audio broadcast
- Data broadcasting
- VSAT services
- Data services
- Telephony services

Satellite Control Network:

Satellite control:	Gunung Raya, Langkawi, Malaysia

MEASAT SYSTEM At A Glance

Satellite name:	Measat 1, 91.5°E; Measat 2, 148°E
Spacecraft data:	
Area of coverage:	Northern Australia, Hong Kong, India, Kampuchea, Laos, Malaysia, Myanmar, Philippines, Singapore, Taiwan, Thailand, Vietnam, and parts of southern China
Mass (in orbit):	839 kg (1); 880 kg (2)
Primary power (EOL):	1,650 W
Stabilization:	Spin
Launch date:	January 12, 1996 (1); November 13, 1996 (2)
Launch vehicle:	Ariane 44L
Expected lifetime:	12 years (1); 11.5 years (2)
Transponders:	
Number:	12 @ 36 MHz C-band, 5 @ 54 MHz Ku-band (1); 6 @ 72 MHz C-band, 9 @ 48 MHz Ku-band (2)
Frequency band:	C-band: Uplink - 5925-6425 MHz, Downlink - 3700-4200 MHz (1 and 2); Ku-band: Uplink - 14.00-14.25 GHz, 13.76-13.87 GHz, Downlink - 10.95-11.20 GHz, 11.45-11.70 GHz, 12.20-12.70 GHz (1); Ku-band: Uplink - 13.75-14.5 GHz, Downlink - 10.95-11.20 GHz, 11.45-11.70 GHz, 12.20-12.70 GHz (2)
Power output:	112 W TWTA, 12 SSPA (1); 65 medium and 90 high TWTA, 10 SSPA (2)
Polarization:	Linear
Redundancy:	C-band: 3 (1), 1 (2); Ku-band: 1 (1), 2 (2)
EIRP:	40 (C-band); 58 (Ku-band)
G/T:	+2.5 dB/°K (C-band); +10 dB/°K (Ku-band)
Single carrier saturation flux density:	-88 dBW/m^2
Manufacturer:	Hughes

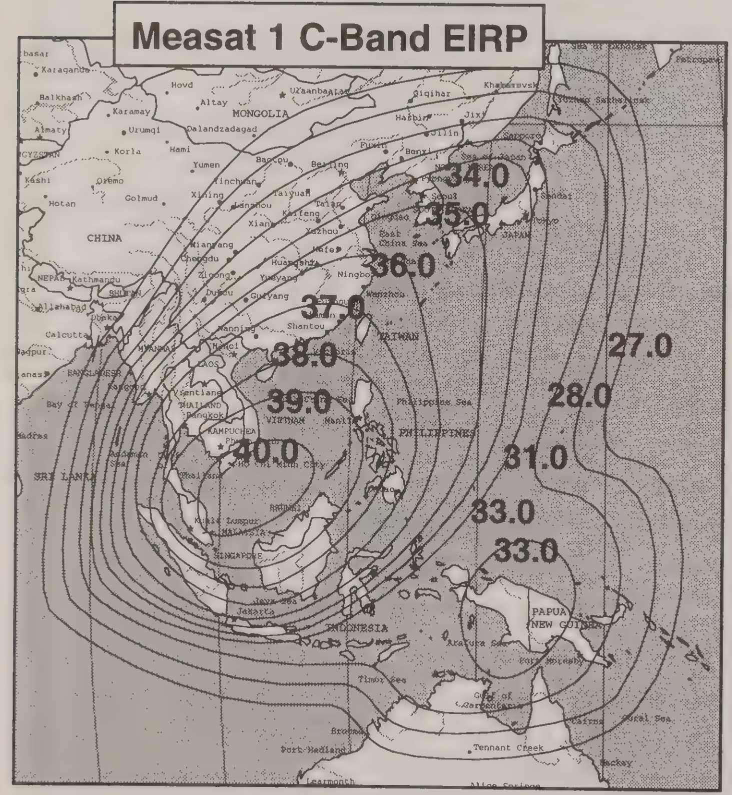
Measat 1

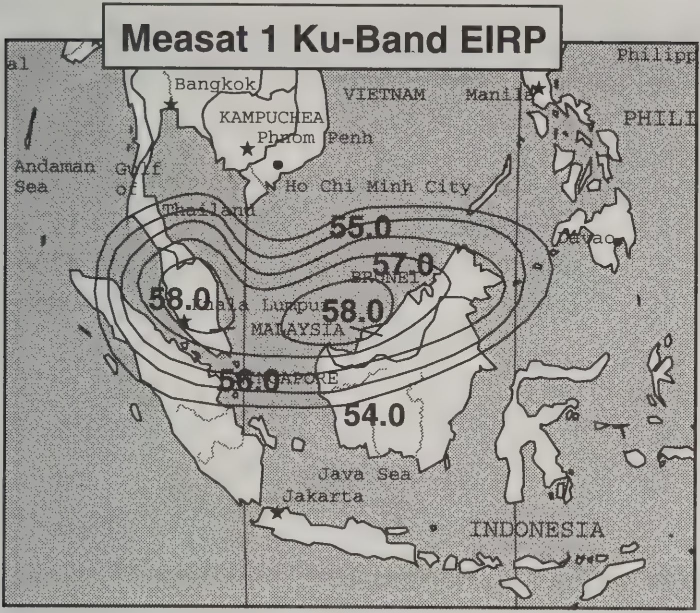
Orbital location:	91.5ºE
Launch:	January 12, 1996
Expected lifetime:	12 years
Expected end of life:	2008

Antennas beam coverage overview:

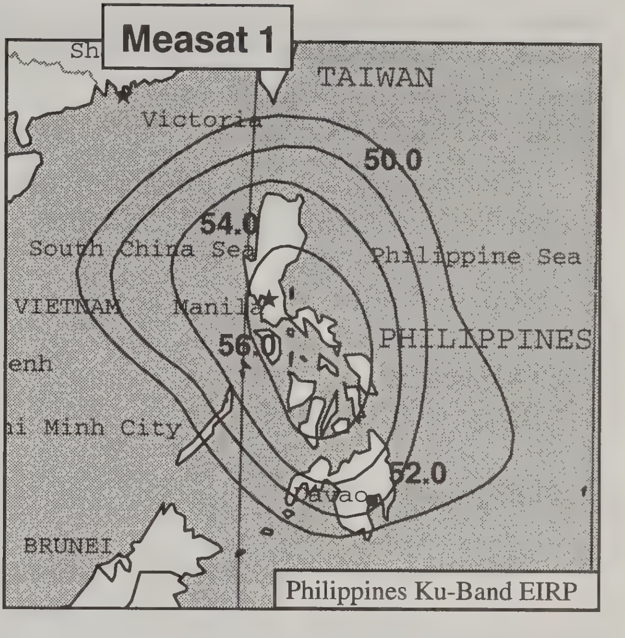
C-band, Ku-band:	Northern Australia, Hong Kong, India, Kampuchea, Laos, Malaysia, Myanmar, Philippines, Singapore, Taiwan, Thailand, Vietnam, and parts of southern China

Measat 1 C-Band EIRP



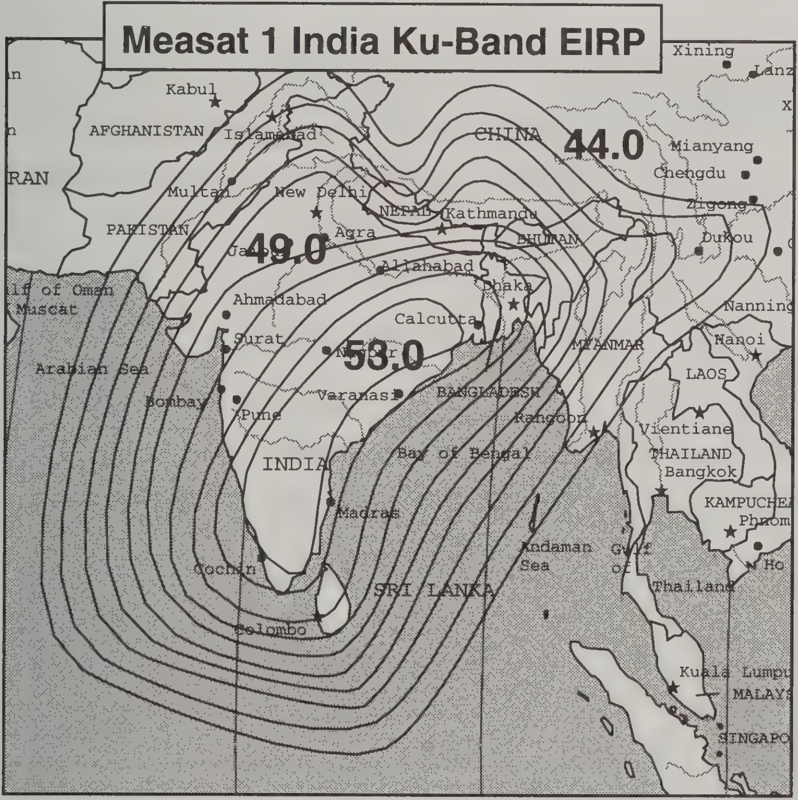


Measat 1 Ku-Band EIRP



Measat 1

Philippines Ku-Band EIRP



Measat 1 India Ku-Band EIRP

TELECOMUNICACIONES DE MEXICO

Director Technico de Satelites y Telepuertos
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Col. Navarte
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MEXICO

Telephone: +52 (5)629-1173
Facsimile: +52 (5)538-4226
Telex: 170963

Booking Contact:

Juan Manuel Zamudio Zea, Director Technico de Satelites y Telepuertos

Overview:

The Mexican government agency responsible for telecommunications, operates the Morelos and Solidaridad satellite systems. The Morelos domestic satellite system which consists of one C-band and Ku-band satellite used to carry digital data, television and broadcasting traffic. The Solidaridad regional satellite system which consists of two C-band, Ku-band and L-band satellites provides telephony, broadcasting traffic and mobile services.

Services Offered:

- Data transmission and reception
- Commercial and educational television
- Analog and digital telephony at C-band. High quality audio channel for broadcasting services
- Broadcasting traffic
- Mobile services

Satellite Control Network:

Primary control center: Mexico, DF

Alternate control center: Hermosillo, Son.

TT&C stations: Mexico, DF

MORELOS SYSTEM At A Glance

Satellite name:	Morelos F2, 243.2°E (116.8°W); Morelos F3, 243.2°E (116.8°W) [to be launched]
Spacecraft data:	
Mass (in orbit):	646.5 kg
Primary power (EOL):	760 W
Stabilization:	Spin
Launch date:	November 26, 1985 (F2); 1998 (F3)
Launch vehicle:	Space Shuttle (F2)
Expected lifetime:	9 years (still operational) [F2]
Transponders:	
Number:	22 (F2); 24 (F3)
Power output:	7 W TWTA (C-band narrowband); 10.5 W TWTA (C-band wideband); 20 W TWTA (Ku-band wideband)
Polarization:	Orthogonal
Redundancy:	4:2 (C-band), 2:1 (Ku-band)
G/T:	0 dB/K (C-band narrowband); 2.0 dB/K (C-band wideband); 1 dB/K (Ku-band EOC)
Receive G/T:	3.4 dB/K (C-band narrowband); 1.8 dB/K (C-band wideband); -0.5 dB/K (Ku-band EOC)
Single carrier saturation flux density:	-88 dBW/m^2
Manufacturer:	Hughes

Morelos Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1W/L[1]	H	36	36	5.945	3.720
1N[2]	V	36	36	5.965	3.740
1W/U[3]	H	36	36	5.985	3.760
2N[4]	V	36	36	6.005	3.780
2W/L[5]	H	36	36	6.025	3.800
3N[6]	V	36	36	6.045	3.820
2W/U[7]	H	36	36	6.065	3.840
4N[8]	V	36	36	6.085	3.860
3W/L[9]	H	36	36	6.105	3.880
5N[10]	V	36	36	6.125	3.900
3W/U[11]	H	36	36	6.145	3.920
6N[12]	V	36	36	6.165	3.940
4W/L[13]	H	36	36	6.185	3.960
7N[14]	V	36	36	6.205	3.980
4W/U[15]	H	36	36	6.225	4.000
8N[16]	V	36	36	6.245	4.020
5W/L[17]	H	36	36	6.265	4.040
9N[18]	V	36	36	6.285	4.060
5W/U[19]	H	36	36	6.305	4.080
10N[20]	V	36	36	6.325	4.100
6W/L[21]	H	36	36	6.345	4.120
11N[22]	V	36	36	6.365	4.140
6W/U[23]	H	36	36	6.385	4.160
12N[24]	V	36	36	6.405	4.180

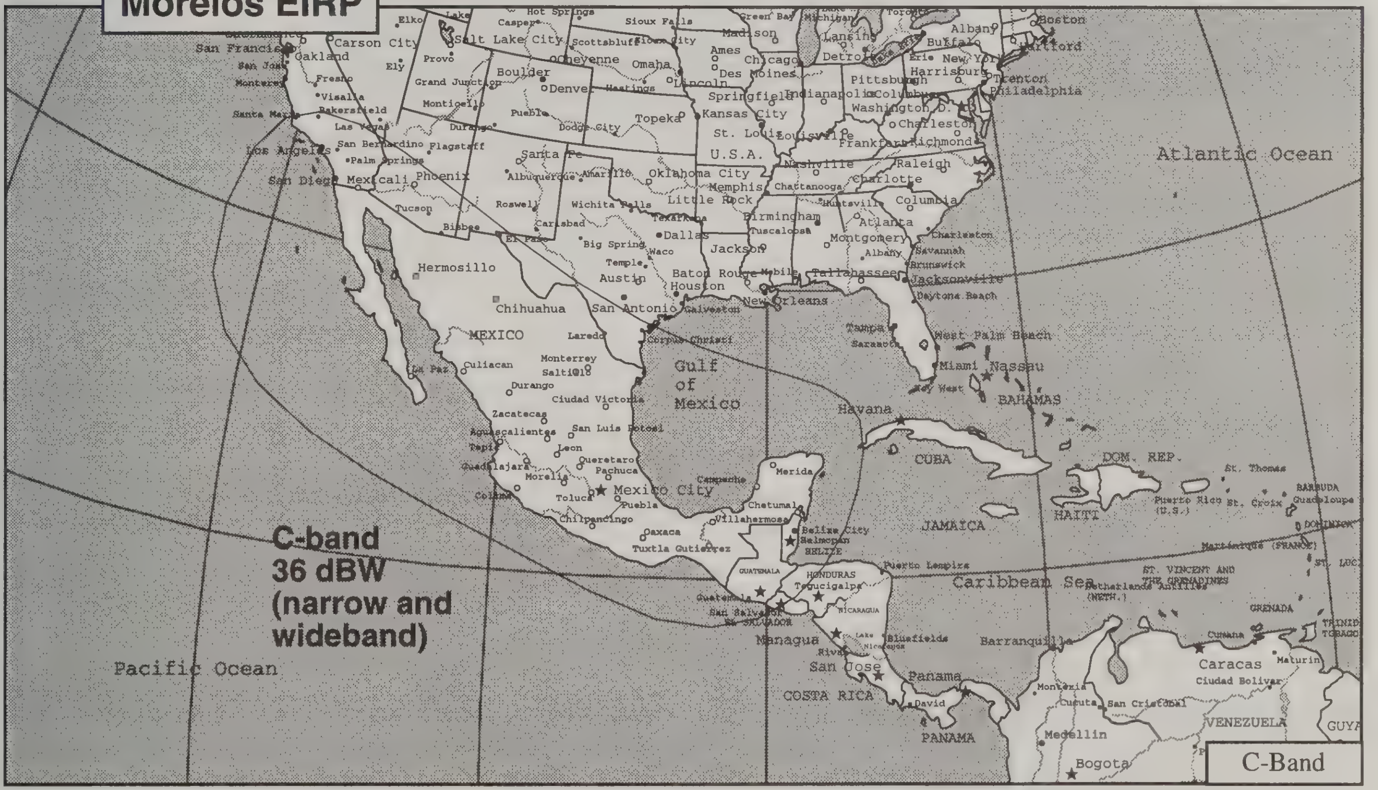
Morelos F2

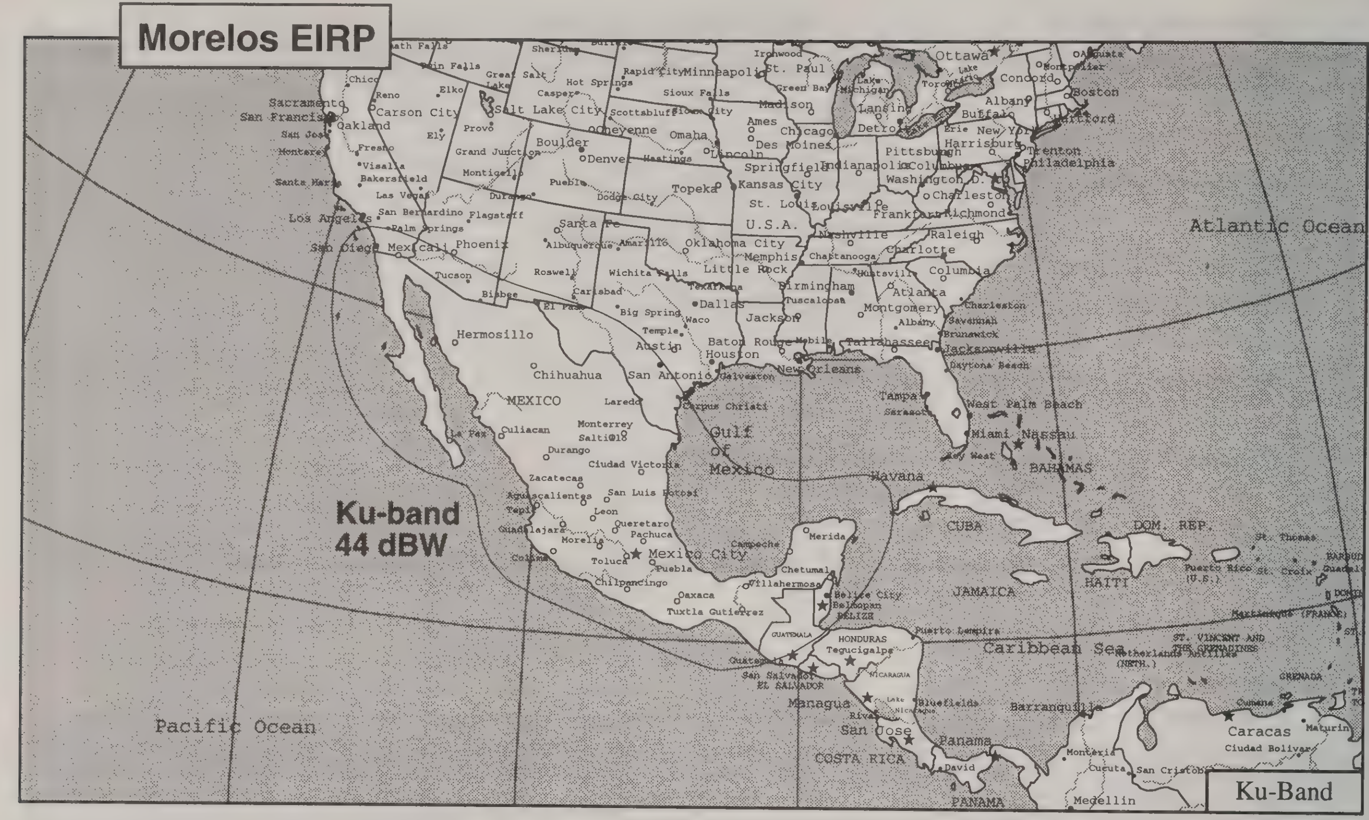
Orbital location:	243.2°E (116.8°W)
Launch:	November 26, 1985, NASA
Expected lifetime:	9 years
Expected end of life:	1994 (extended to 1998)

Antennas beam coverage overview:

C-band, Ku-band:	Mexico, Southwestern USA

Morelos EIRP





Morelos EIRP

SOLIDARIDAD SYSTEM At A Glance

Satellite name:	Solidaridad I, 250.8°E (109.2°W); Solidaridad II, 247°E (113°W)
Spacecraft data:	
Mass (in orbit):	1,641 kg
Primary power (EOL):	3,156 W (summer solstice), 3,370 W (autumn equinox)
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	November 19, 1993 (Solidaridad I); October 7, 1994 (Solidaridad II)
Launch vehicle:	Ariane 44L
Expected lifetime:	14 years
Transponders:	
Number:	18 C-band (12 36 MHz bandwidth, 6 72 MHz bandwidth), 15 Ku-band, 1 L-band
Power output:	45 W TWT (Ku-band), 14.4 W, 16 W, 10.3 W SSPA (C-band), 24.83 W SSPA (L-band)
Polarization:	Orthogonal
Redundancy:	3:2 (C-band), 5:3 (Ku-band)
G/T:	R1H = 3.28 dB/K, R1V=0.76 dB/K, R2=-1.2 dB/K, R3=2.32 dB/K (C-band); R4H=3.55 dB/K, R4V=2.35 dB/K (Ku-band); -1.5 dB/K EOC (L-band)
Receive G/T:	R1H=5.10 dB/K (C-band); R3V=4.0 dB/K, R2=0.02 dB/K, R3=2.7 dB/K, R4H=5.00 dB/K, R4V=5.60 dB/K, R5=5.6 dB/K (Ku-band)
Single carrier saturation flux density:	-92 to -95 dBW/sq.m. (C-band), -106 dBW/sq.m. (L-band), -95 dBW/sq.m. (Ku-band)
Manufacturer:	Hughes

Solidaridad I & II Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1W/L[2]	H	72	37.5	5.965	3.740
2N[3]	V	36	37.5	5.985	3.760
1W/U[4]	H	72	37.5	6.005	3.780
3N[5]	V	36	37.5	6.025	3.800
4N[7]	V	36	37.5	6.065	3.840
2W/U[8]	H	72	37.5	6.085	3.860
5N[9]	V	36	37.5	6.105	3.880
3W/L[10]	H	72	37.5	6.125	3.900
6N[11]	V	36	37.5	6.145	3.920
7N[13]	V	36	37.5	6.185	3.960
4W/L[14]	H	72	37.5	6.205	3.980
8N[15]	V	36	37.5	6.225	4.000
4W/U[16]	H	72	37.5	6.245	4.020
9N[17]	V	36	37.5	6.265	4.040
5W/L[18]	H	72	37.5	6.285	4.060
10N[19]	V	36	37.5	6.305	4.080
11N[21]	V	36	37.5	6.345	4.120
6W[22]	H	36	37.5	6.365	4.140
12N[23]	V	36	37.5	6.385	4.160

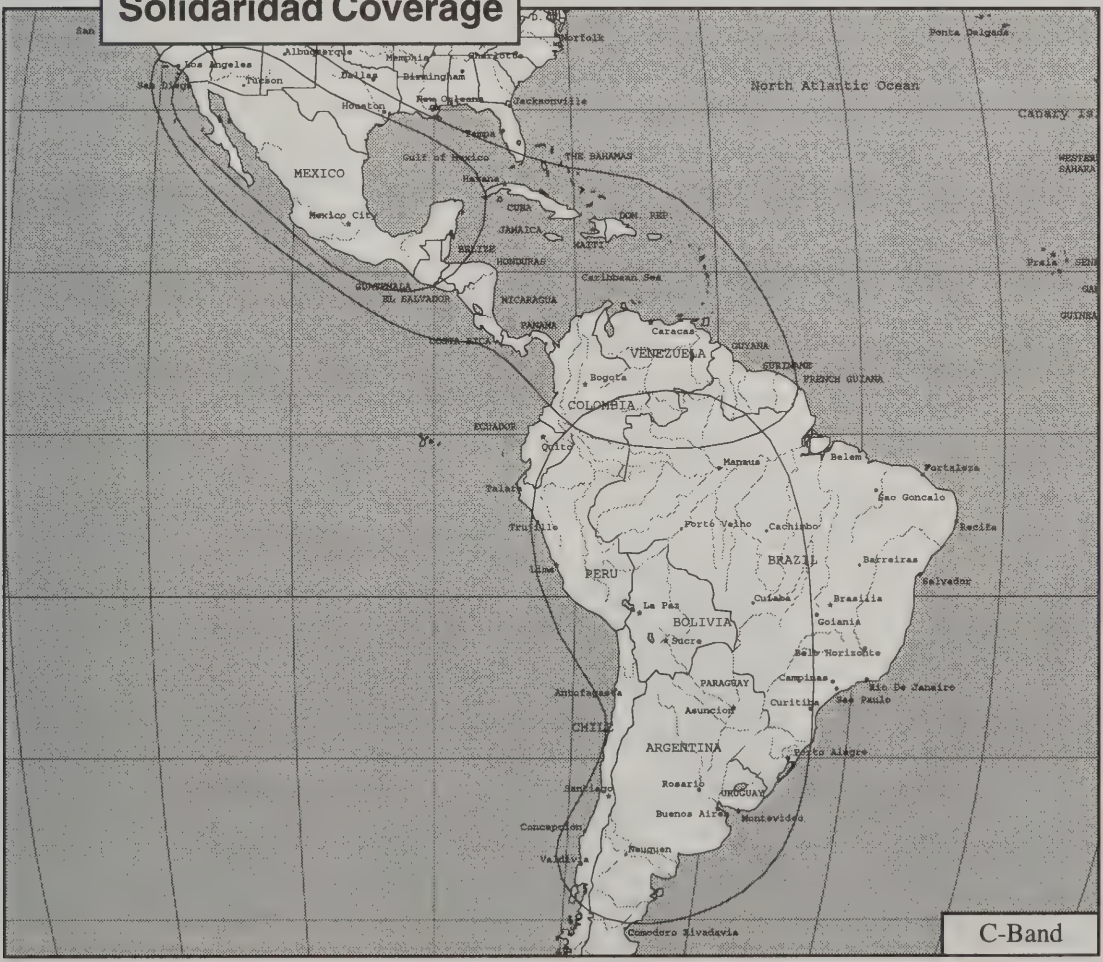
Solidaridad I, II

Orbital location:	250.8°E (109.2°W) [I], 247°E (113°W) [II]
Launch:	November 19, 1993, Ariane 44L (I); October 7, 1994, Ariane 44L (II)
Expected lifetime:	14 years
Expected end of life:	2007 (I), 2008 (II)

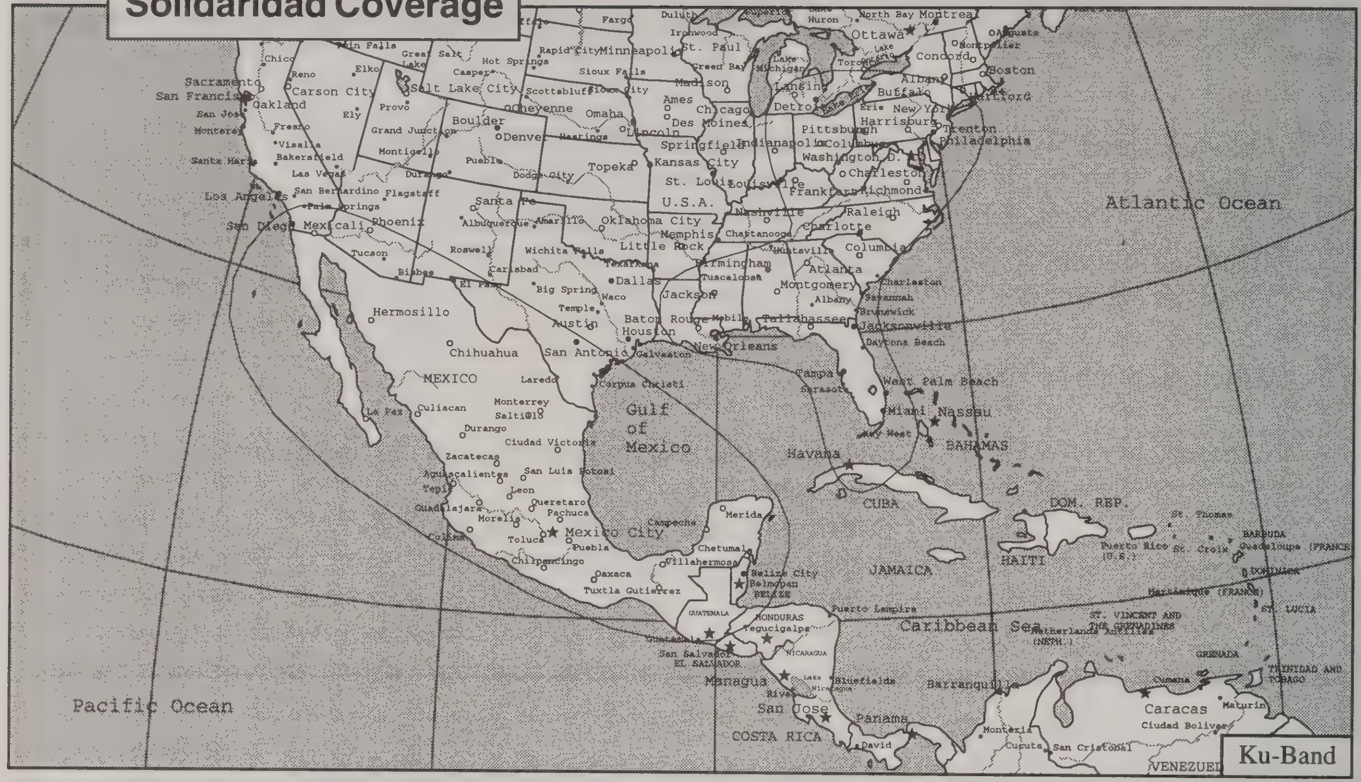
Antennas beam coverage overview:

C-band:	Mexico, Central and South America, Southwestern US, Caribbean
Ku-band:	Mexico, Central America, some US cities
L-band:	Mexico and its territorial waters

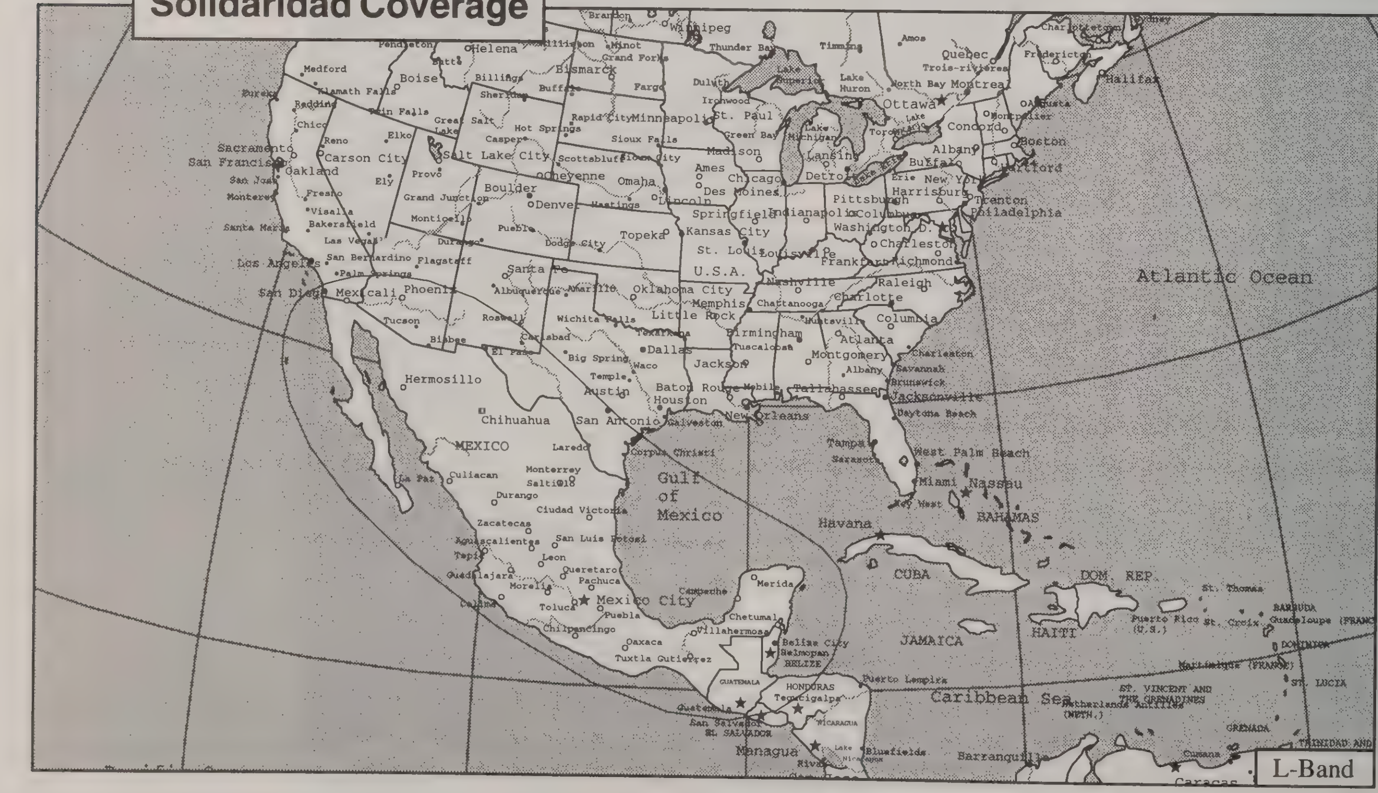
Solidaridad Coverage



Solidaridad Coverage



Solidaridad Coverage



TELENOR SATELLITE SERVICES AS

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Facsimile: +47 22 77 79 80
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Web Site Address: www.telenor.no

Booking Contact:

Gunnar Bjorkavaag, Director of Broadcast Division

Public Relations Contact:

Jan Thomas Bahnsen, Marketing Director

Overview:

Operates Thor (formerly Marcopolo II), providing direct broadcast satellite service to all Scandinavian countries. Has leased capacity on Intelsat VII and TV-Sat 2, both collocated with Thor. Provides 23 TV-channels, fixed satellite services and occasional traffic from 359.2°E (.8°W). Runs two large earth stations: Nittedal Earth Station and Eik LES. Telenor Satellite Services AS is the Norwegian signatory of Intelsat, Eutelsat and Inmarsat. Telenor plans to launch a new satellite, Thor II, with 15 transponders. The launch has been delayed because of the Delta 2 failure at Cape Canaveral. All Delta launches are on indefinite hold and the estimated delay is between 4 and 6 months. The satellite will be used mainly for TV-broadcast services.

Services Offered:

- DBS services
- Turn-around traffic
- Satellite news gathering
- VSAT networks
- Data services to mobile users

Satellite Control Network:

Satellite control: Chilworth (near Southampton, UK)

TT&C stations: Nittedal, Åland, Chilworth (near Southampton, UK)

THOR SYSTEM At A Glance

Satellite name: Thor I, 359.2°E (.8°W);
Thor II, 359.2°E (.8°W) [to be launched]

Spacecraft data:

- Mass (in orbit): 660 kg
- Primary power (EOL): 1,060 W (I), 1,500 W (II)
- Eclipse protection: All transponders
- Stabilization: Spin
- Launch date: August 17, 1990 (I); 1997, indefinite (II)
- Launch vehicle: Delta 6925
- Expected lifetime: Minimum 10 years (I); 11.5 years (II)

- Transponders:
  - Number: 5 DBS @ 27 MHz bandwidth
  - Power output: 55 W TWTA
  - Uplink frequency: 11.7-12.1 GHz
  - Downlink frequency: 17.3-17.7 GHz
  - Polarization: RHCP
  - Bandwidth: 27 MHz

- Single carrier saturation flux density: -85 dBW/sq. m.

- Manufacturer: Hughes

Thor I Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink (GHz)	Downlink(GHz)
04	RHCP	27	60	17.38502	11.785
08	RHCP	27	60	17.46174	11.862
12	RHCP	27	60	17.53846	11.938
16	RHCP	27	60	17.61518	12.015
20	RHCP	27	60	17.69190	12.092

Thor II Transponder Frequency Plan

Tr.#	Pol.	Downlink(GHz)
1	H	11.21565
2	V	11.228625
3	H	11.246875
4	V	11.260750
5	H	11.278125
6	V	11.292875
7	H	11.309375
8	V	11.325000
9	H	11.340625
10	V	11.357125
11	H	11.371875
12	V	11.389250
13	H	11.403125
14	V	11.421375
15	H	11.434375

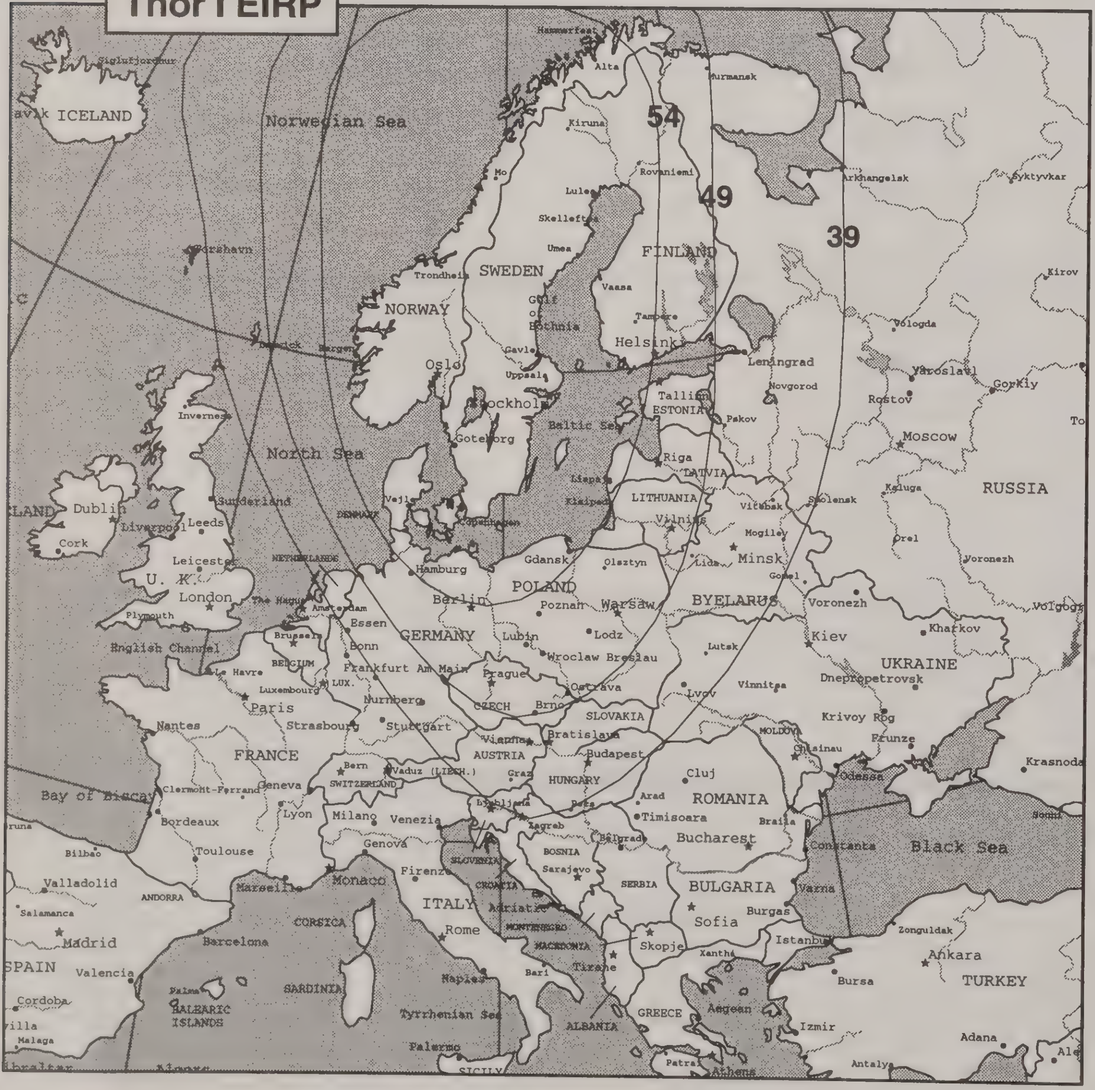
Thor I

Orbital location:	359.2ºE (.8°W)
Launch:	August 17, 1990, Delta 6925
Expected lifetime:	Minimum 10 years
Expected end of life:	2002

Antennas beam coverage overview:

Ku-band:	Scandinavia

Thor I EIRP



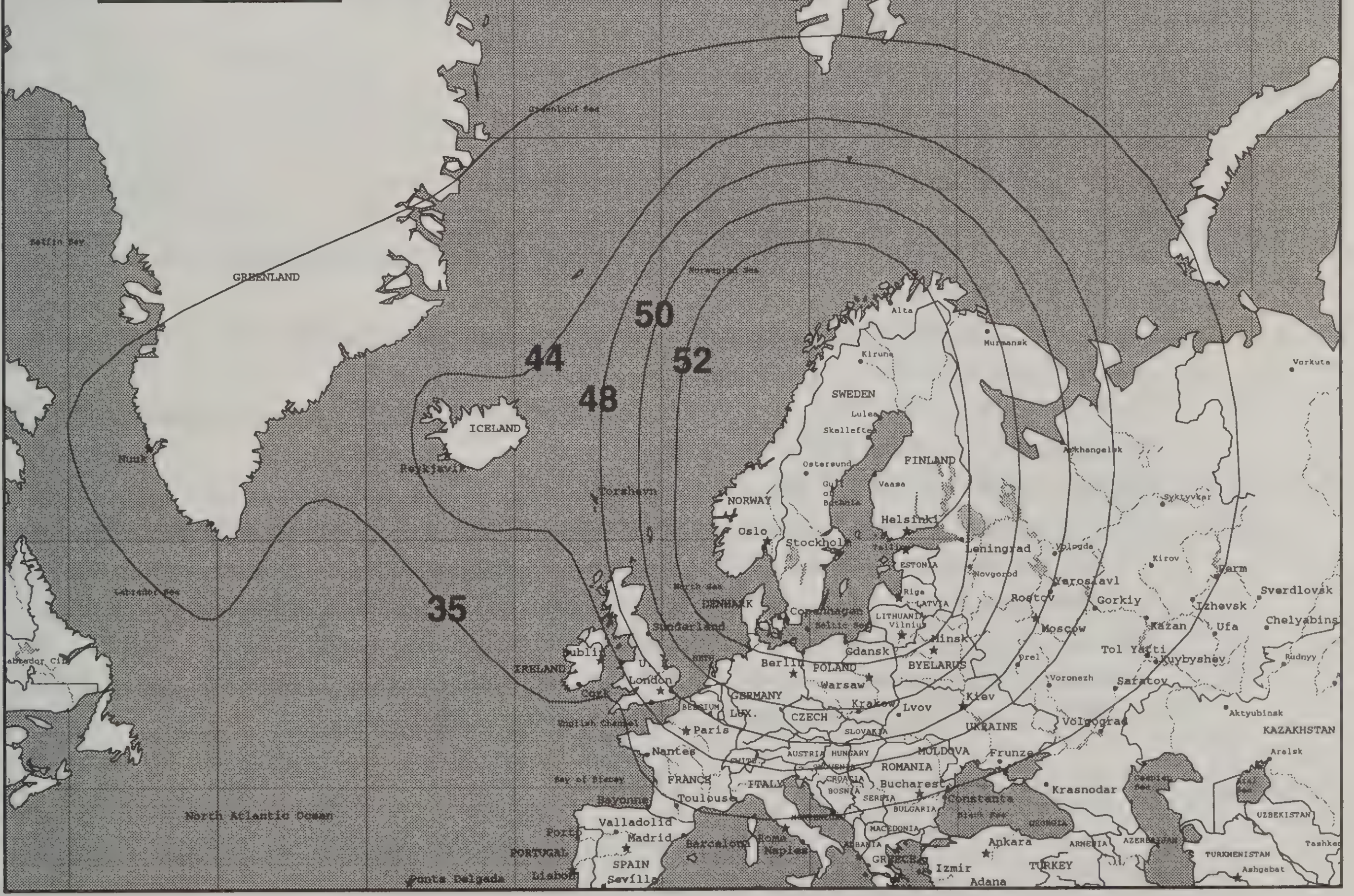
Thor II

Orbital location:	359.2°E (.8°W)
Launch:	1997 (indefinite) [to be launched]
Expected lifetime:	11.5 years
Expected end of life:	2008

Antennas beam coverage overview:

Ku-band:	Scandinavia and Northern Europe

Thor II EIRP



MINISTRY FOR POSTAL SERVICES AND TELECOMMUNICATIONS (RUSSIA)

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Moscow 113162		Facsimile:	+7 (095)923 49 33
RUSSIA			

Booking Contact:

Aleksandr E. Krupnov, Director, International Cooperation Department

Overview:

Operates the Gorizont, Ekran, Loutch, Raduga, and Arkos domestic satellite systems. Provides telephone, telegraph and television broadcast through more than 6,000 ground stations. Plans to launch the Gelikon satellite system to replace existing Gorizont satellites and improve satellite communications in the Commonwealth of Independent States.

Services Offered:

- Gorizont satellites: telephone, telegraph, phototelegraph, television, and broadcasting signals within CIS. Also supports international TV and telephony services of Intersputnik. The Orbita, Moskva and Moskva-Global TV cast services are transmitted via Gorizont satellites.
- Ekran satellites: direct broadcast satellite service within CIS. The Ekran broadcast system is transmitted on Ekran satellites.
- Loutch satellites: satellite data relay for the Mir space station, TV teleconferencing, emergency communications services
- Raduga satellites: primarily government and military use
- Arkos satellites: mobile communications service as part of the Marathon system, which will include telephone, telegraph and facsimile communications with mobile end users. The Marathon system will consist of three to four Arkos satellites in geostationary orbit and two to four Mayak satellite in the highly elliptical Molniya orbit.
- Gelikon satellite: transmission of four TV channels and regional channels as part of STV-12 system. Implementation of this system is still undecided.

Satellite Control Network:

Satellite control:	Moscow

RADUGA SYSTEM At A Glance

Satellite name:	Raduga 22/Statsionar 27, 12°E; Raduga 28/Statsionar 2, 35°E; Raduga 23/Statsionar 9, 45°E; Raduga 1-3/Statsionar 24, 49°E; Raduga 32/Statsionar 20, 70°E; Raduga 30/Statsionar 3, 85°E
Spacecraft data:	
Mass (in orbit):	1,965 kg
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	October 1988 (Raduga 22); December 1991 (Raduga 28); April 1989 (Raduga 23); December 1990 (Raduga 1-3); February 1990 (Raduga 32); March 1988 (Raduga 30);
Expected lifetime:	5 years
Transponders:	
Number:	11 (Raduga 23 has 6)
Power output:	15 W TWTA
Polarization:	LHCP (earth-space link), RHCP (space-earth link)
Manufacturer:	NPO PM

A Note on the Statsionar System:

The ITU registration designation of the Russian satellites is the Statsionar system. Raduga and Gorizont satellites are known by both a Raduga/Gorizont flight number and a Statsionar number. For example, both Gorizont 12 and 22 are in the Statsionar 12 orbital slot.

Raduga Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	RCHP	36	32*	5.750	3.425
2	RCHP	36	32*	5.800	3.475
3	RCHP	36	32*	5.850	3.525
4	RCHP	36	32*	5.900	3.575
5	RCHP	36	32*	5.950	3.625
6	RCHP	36	32*	6.000	3.675
7	RCHP	36	32*	6.050	3.725
8	RCHP	36	32*	6.100	3.775
9	RCHP	36	32*	6.150	3.825
10	RCHP	36	32*	6.200	3.875
11	RCHP	36	32*	6.250	3.925

* North hemispheric beam; Global beam: 29 dBW; spot beam: 45 dBW

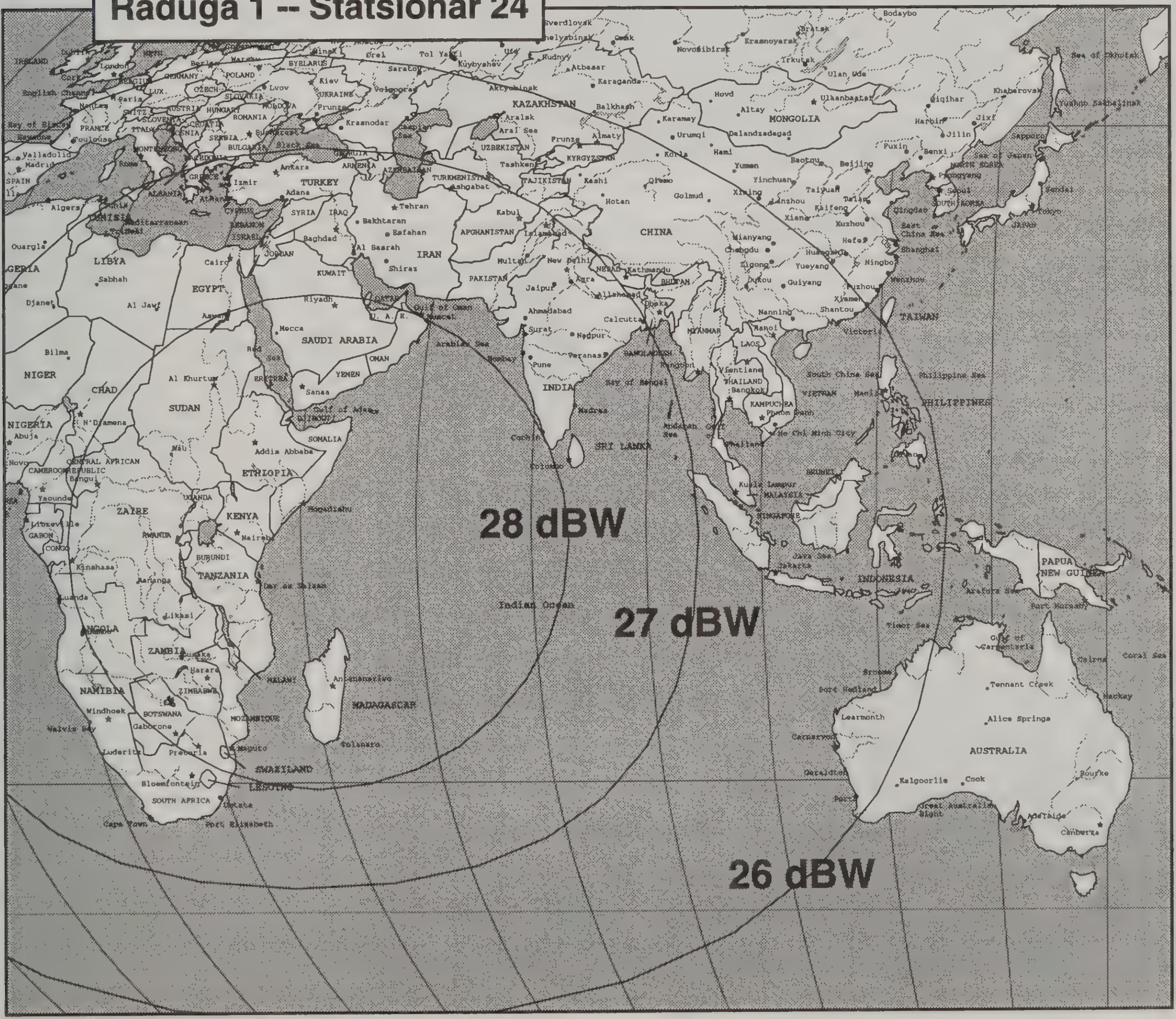
Raduga

Orbital location:	35ºE (Statsionar 2), 45ºE (Statsionar 9), 49ºE (Statsionar 24), 70ºE (Statsionar 20), 85ºE (Statsionar 3),

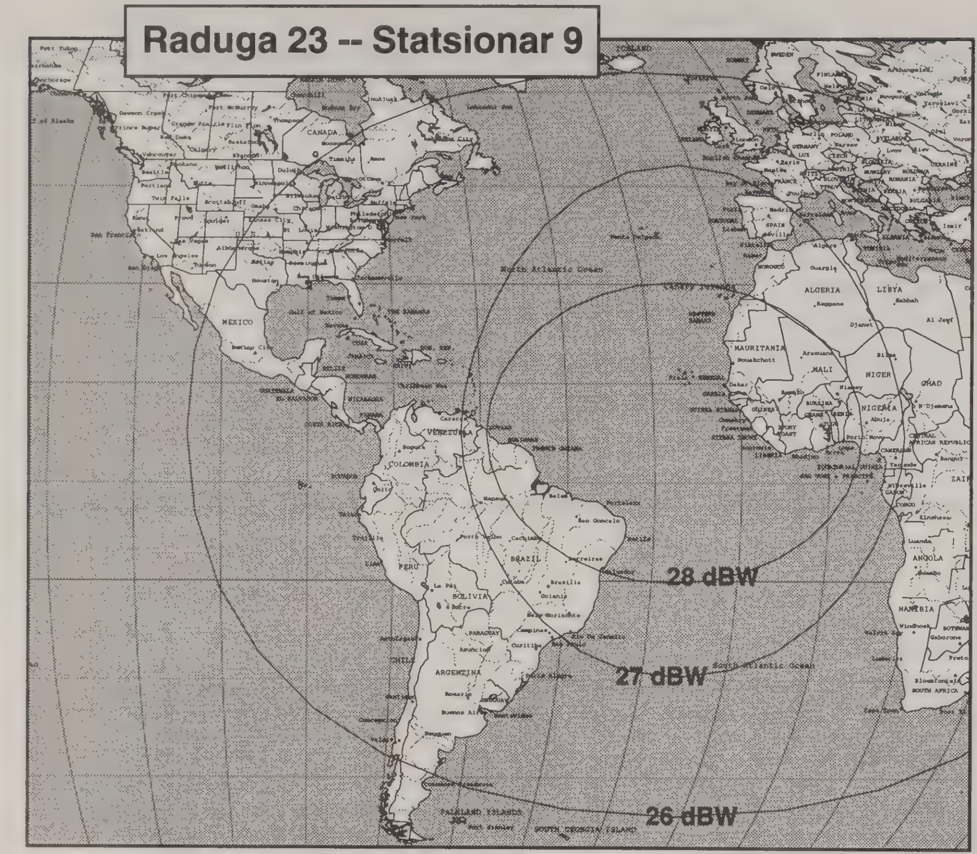
Antennas beam coverage overview:

C-band:	Indian Ocean region, Western Pacific region, Atlantic Ocean region, CIS, Africa

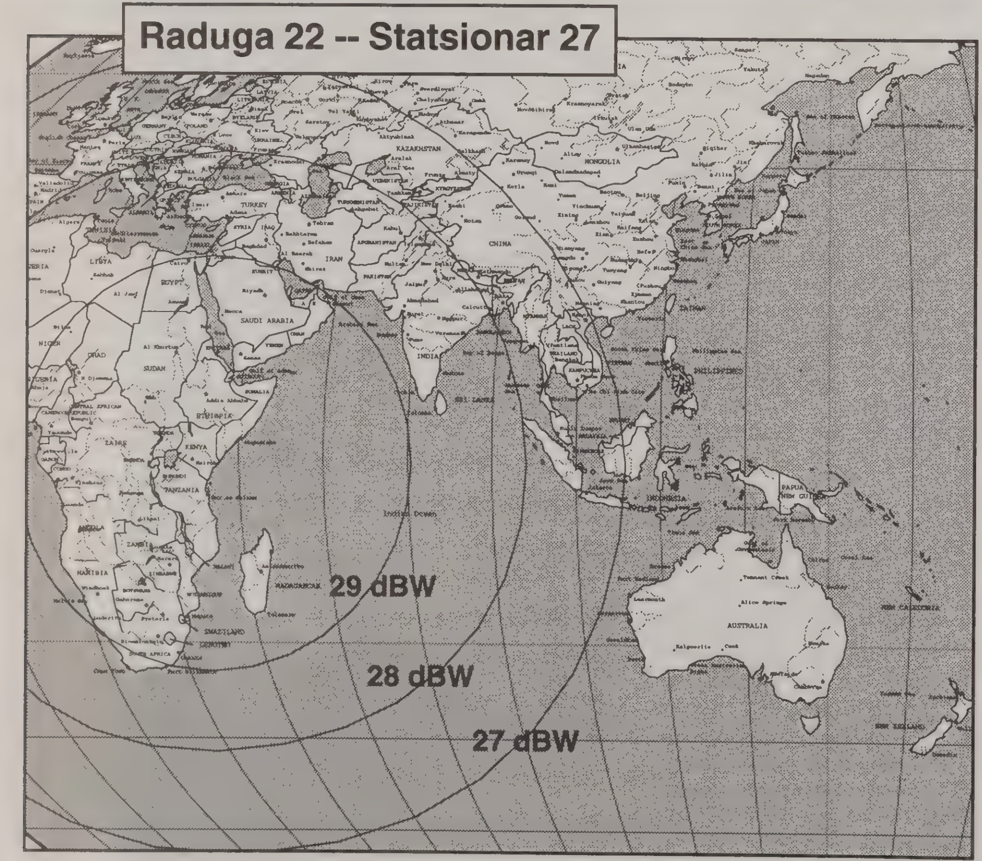
Raduga 1 -- Statsionar 24



Raduga 23 -- Statsionar 9



Raduga 22 -- Statsionar 27



GORIZONT SYSTEM At A Glance

Satellite name:	Gorizont 31/Statsionar 12, 40°E; Gorizont 24/Statsionar 13, 80°E; Gorizont 27/Statsionar 5, 53°E; Gorizont 18/Statsionar 7, 140°E; Gorizont 19/Statsionar 14, 96°E; Gorizont 28/Statsionar 6, 90°E; Gorizont 21/Statsionar 16, 145°E; Gorizont 26/Statsionar 11, 349°E (11°W); Gorizont 25/Statsionar 21, 103°E; Gorizont 41/Statsionar 41, 130°E; Gorizont 42/Statsionar 42, 142.5°E
Spacecraft data:	
Mass (in orbit):	2,500 kg
Primary power (EOL):	1,300 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	June 1986 (Gorizont 31); October 1991 (Gorizont 24); January 1989 (Gorizont 27); July 1989 (Gorizont 18); September 1989 (Gorizont 19); November 1986 (Gorizont 28); July 1992 (Gorizont 26); April 1992 (Gorizont 25)
Expected lifetime:	5 years
Transponders:	
Number:	6 C-band, 1 Ku-band, 1 L-band
Power output:	5 channels at 15 W; 1 channel at 40 W; 1 channel (Ku-band spot beam) at 20 W L-band channel cross-strapped to C-band transponder for L-band Volna service
Polarization:	RHCP
Manufacturer:	NPO-PM

Gorizont Transponder Frequency Plan **

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
6[-1]	RHCP	34	28*	6.000	3.675
7[1]	RHCP	34	28*	6.050	3.725
8[4]	RHCP	34	28*	6.100	3.775
9[6]	RHCP	34	28*	6.150	3.825
10[9]	RHCP	34	28*	6.200	3.875
11[11]	RHCP	34	28*	6.250	3.925
Loutch	RHCP				11.541

* Global; N. hemisphere: 31 dBW; Zone: 33 dBW; C-band spot: 42 dBW; Ku-band spot: 38.5 dBW

Ku-band: Uplink: 14.326 GHz; Downlink: 11.526 GHz
L-band: Uplink: 1.6378083 GHz; Downlink: 1.5363083 GHz

**Gorizont satellites usually have 8 transponders: 6 operate in the 6/4 GHz frequency band and are designated as "Statsionar" in the international register. Cross-strapped transponders operate in the 6/1.5 GHz and 1.6/4 GHz frequency band and are designated as "Volna." (This cross-strapping enables links between ship-borne mobile facilities and terrestrial ground stations.) One transponder operates in the 14/11 frequency band and is designated as "Loutch."

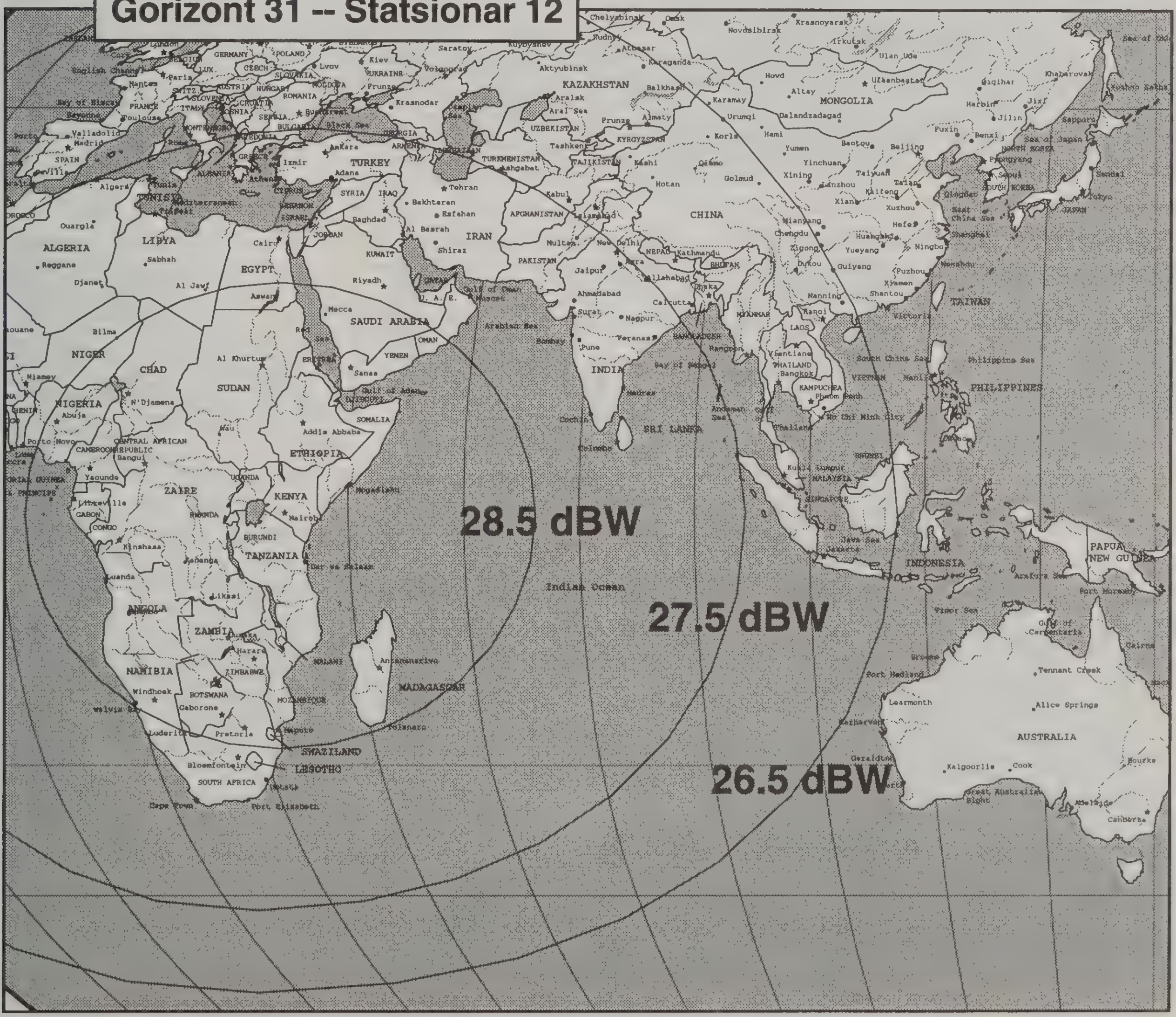
Gorizont

Orbital location:	40ºE (Statsionar 12), 80ºE (Statsionar13), 53ºE (Statsionar 5), 140ºE (Statsionar 7), 96ºE (Statsionar 14), 90ºE (Statsionar 6), 349ºE (11°W) [Statsionar 11], 103ºE (Statsionar 21), 130°E (Statsionar 41), 142.5°E (Statsionar 42), 145°E (Statsionar 16)

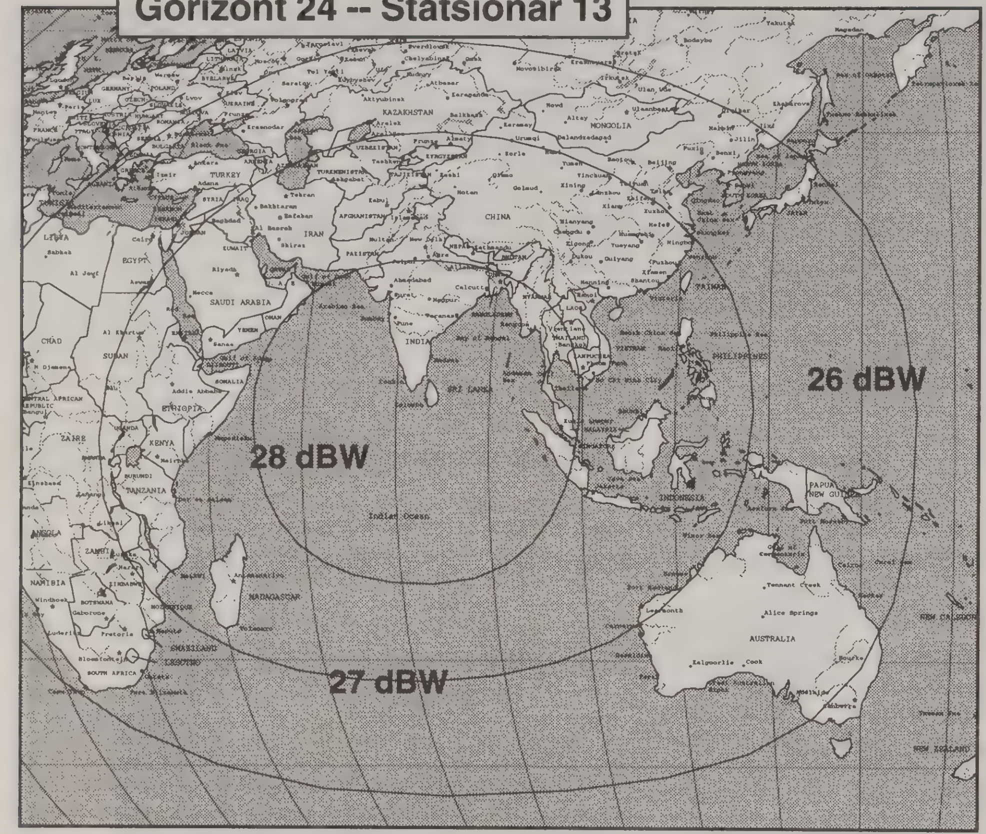
Antennas beam coverage overview:

C-band:	Indian Ocean region, Atlantic Ocean region, CIS, Africa, South America

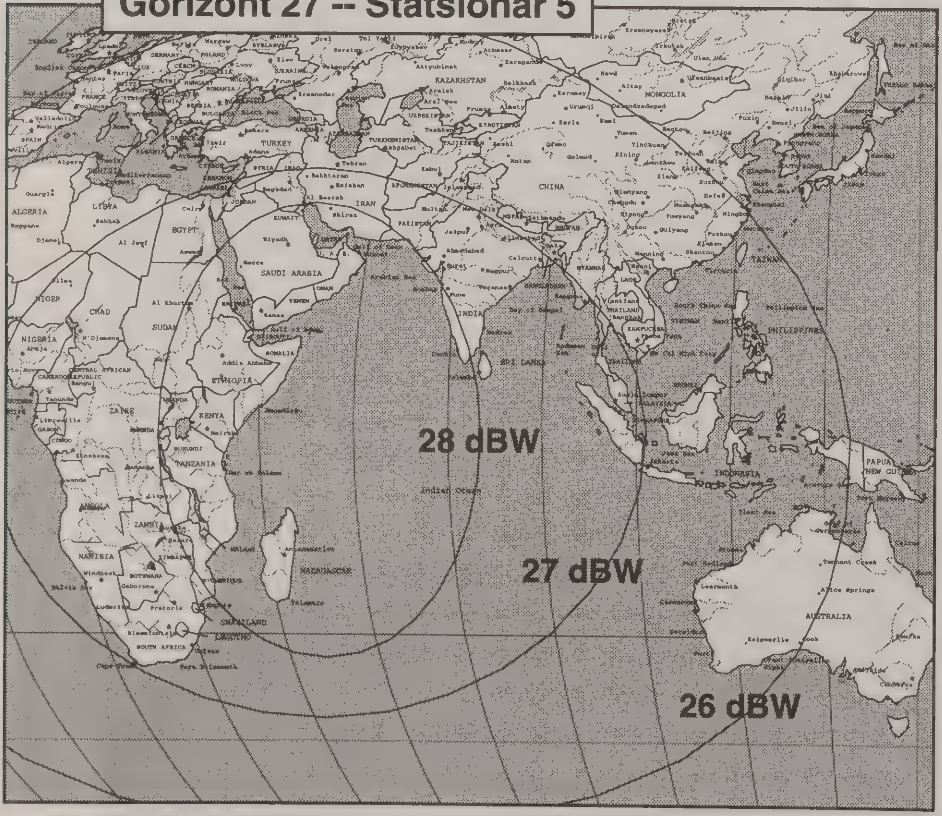
Gorizont 31 -- Statsionar 12



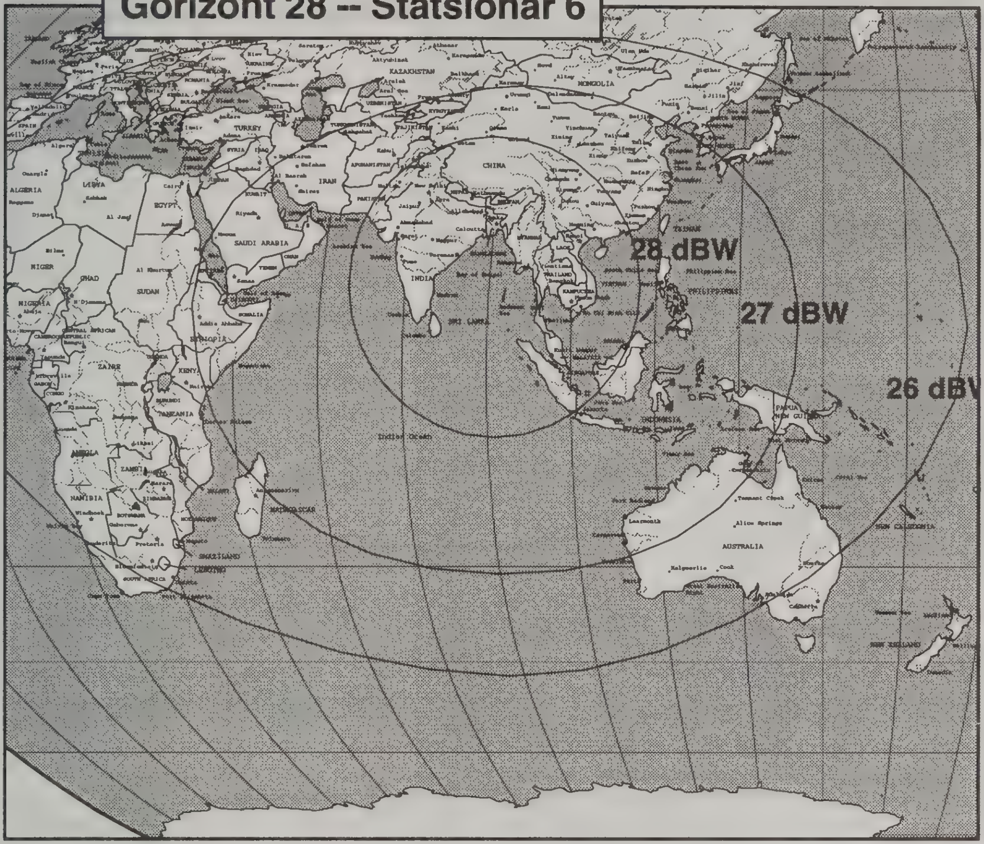
Gorizont 24 -- Statsionar 13



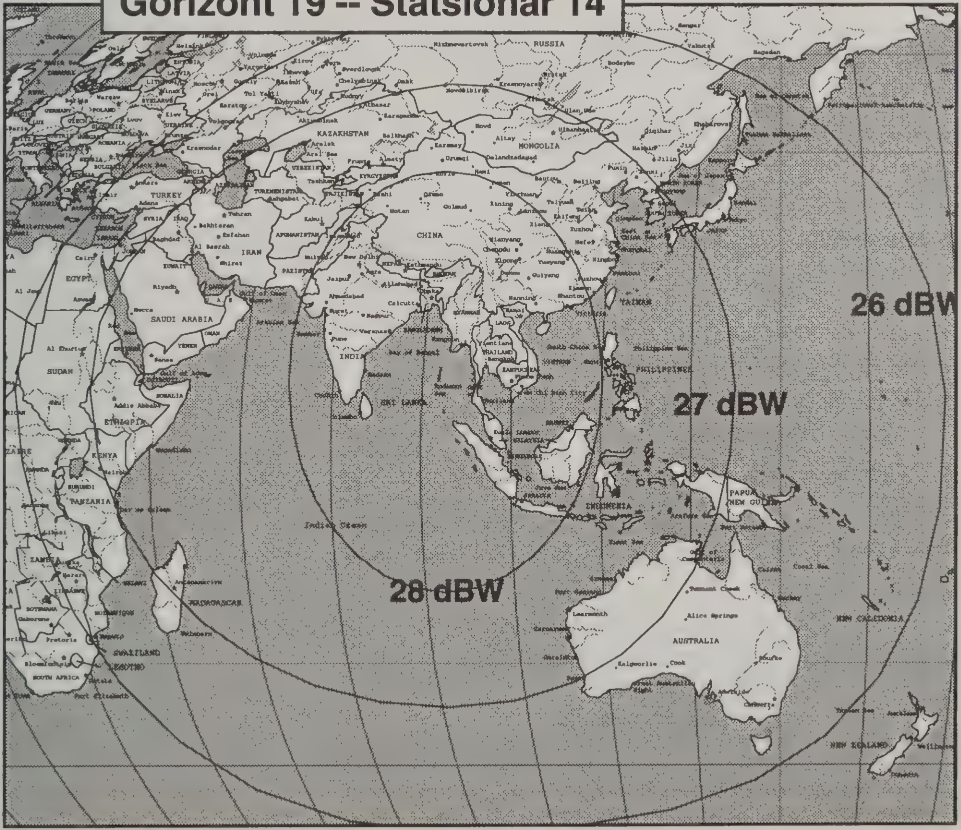
Gorizont 27 -- Statsionar 5



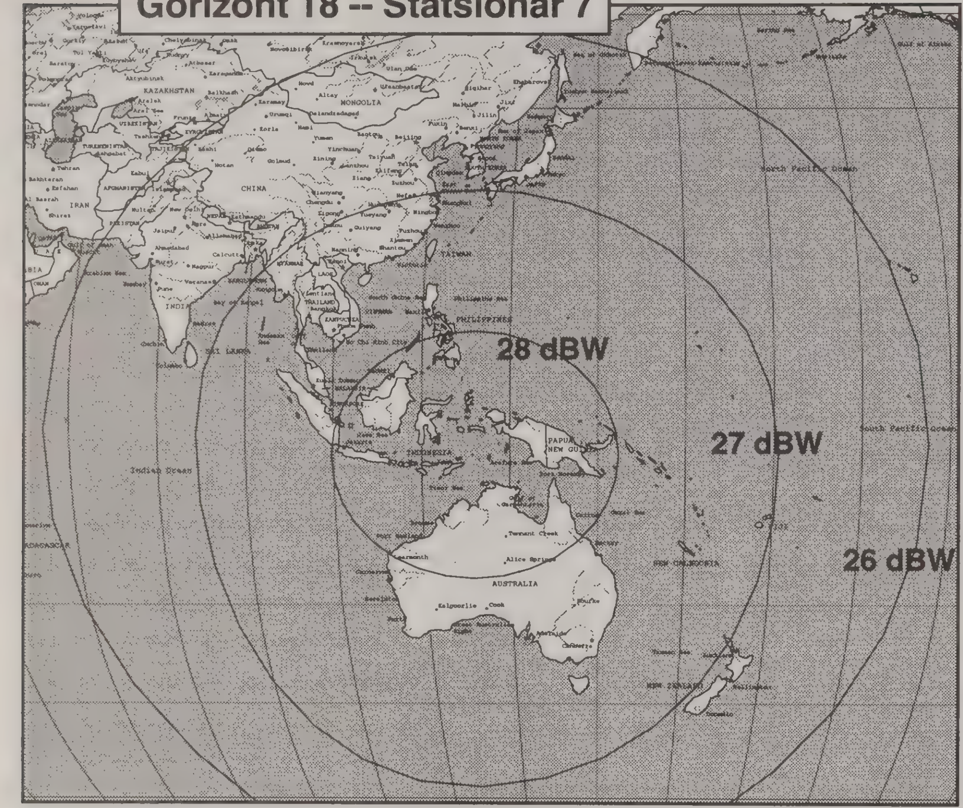
Gorizont 28 -- Statsionar 6



Gorizont 19 -- Statsionar 14



Gorizont 18 -- Statsionar 7



EKRAN SYSTEM At A Glance

Satellite name:	Ekran 20/Statsionar T, 99°E
Spacecraft data:	
Mass (in orbit):	1,970 kg
Primary power (EOL):	1,500 W
Stabilization:	3-axis
Launch date:	Ekran 20: October 1992 (still operational)
Expected lifetime:	3 years
Transponders:	
Number:	1
Power output:	200 W klystron
Polarization:	LHCP (earth-space link), RHCP (space-earth link)
Redundancy:	1 backup
Manufacturer:	NPO-PM

Ekran Transponder Frequency Plan

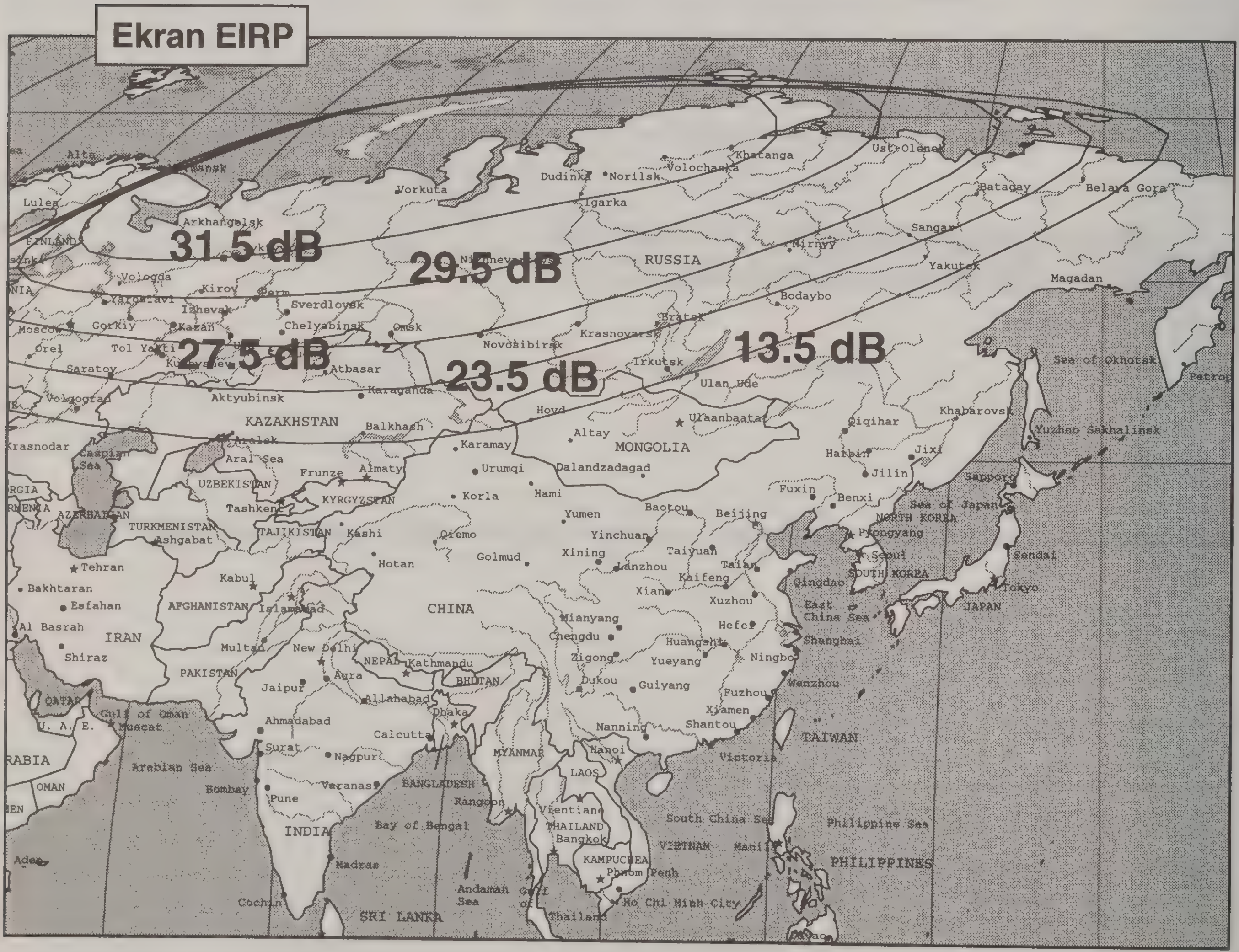
Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	RHCP	24	50-56.5	6.200	0.702-0.726

Ekran

Orbital location:	99ºE
Launch:	October 1992 (Ekran 20)
Expected lifetime:	3 years
Expected end of life:	1995 (Ekran 20, still operational)

Antennas beam coverage overview:

UHF direct broadcast TV:	CIS



Ekran EIRP

LOUTCH SYSTEM At A Glance

Satellite name: SDRN/Loutch, 95°E;
SDRN/Loutch, 344°E (16°W)

Spacecraft data:
- Mass (in orbit): 2,400 kg
- Primary power: 1,800 W
- Expected lifetime: 5 years

- Transponders:
  - Number: 3
  - Power output: 240 W TWTA

Two-way exchange of TV pictures and monitoring and control information operates in the 13/15 GHz frequency band.
Two-way exchange of monitoring and control information is also carried out in the 0.7-0.9 GHz range.
Exchange of information between the satellite data relay network (SDRN) and flight control center uses the 11/14 GHz frequency range.

Manufacturer: NPO-PM

ARKOS SYSTEM At A Glance

Satellite name:	Arkos, 346°E (14°W), 190°E (170°W), 85°E
Spacecraft data:	
Area of coverage:	CIS
Launch date:	Late 1994
Transponders:	
Uplink frequency:	1.5 GHz, 6 GHz
Downlink frequency bands:	1.6 GHz, 4 GHz
Capacity:	350 duplex telephone channels

GELIKON SYSTEM At A Glance

Satellite name:	Gelikon (will operate on an assigned WARC-77 channel)
Spacecraft data:	
Area of coverage:	CIS
Launch date:	Scheduled to be operational in 1997
Transponders:	
Number:	6
Frequency range:	Ku-band, 12 GHz (uplink 18 GHz)

HISPASAT S.A.

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Facsimile: +34 1-372-8941

Booking Contacts:

Damian Gomez, Head Booking Office
Jose Mª Casas, Commercial Manager

Public Relations Contact:

Jose Diaz, Director of External Relations

Overview:

Multi-mission satellite system using Ku-band transmission for government payload.

Services Offered:

- Government payload
- Television and radio broadcast
- Public and private telecommunications networks
- Broadcast services include direct broadcast satellite services, interchange network and communications networks
- Telecommunications networks include transit links, access links, dedicated networks, unidirectional systems, and VSAT interactive systems
- Occasional SNG services, business TV

Satellite Control Network:

Satellite control:	Madrid, Spain
TT&C stations:	Arganda (Madrid), Spain

HISPASAT SYSTEM At A Glance

Satellite name: .... Hispasat 1A and 1B, 330°E (30°W)
Spacecraft data:
- Area of coverage: .... Western Europe, Spain, America
- Mass (in orbit, BOL): .... 2,200 kg
- Primary power (EOL): .... 3,500 W
- Eclipse protection: .... All transponders
- Stabilization: 3-axis
- Launch date: .... September 20, 1992 (1A), July 22, 1993 (1B)
- Launch vehicle: .... Ariane 4
- Expected lifetime: .... 10 years

Transponders:
- Number: .... 16 Ku-band FSS, 5 DBS, 2 America
- Power output: .... 16 x 55 W (FSS), 5 x 110 W (DBS), 2 x 110 W (America)
- Polarization: .... Linear (FSS and America), Circular (DBS)
- Redundancy: .... 12:8 (FSS), 5:3 (DBS), 2:1 (America)
- G/T: .... +10 dB/K

Single carrier saturation flux density: .... -85 dBW/sq.m.

Manufacturer: .... Matra-Marconi Space

Hispasat Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	46	50-52	14.039	12.544*
2	V	36	50-52	14.086	12.591
3	V	36	50-52	14.126	12.631
4	V	36	50-52	14.166	12.671
5	V	36	50-52	14.206	12.711
6	V	27	50-52	14.249	12.015 (TV America)
7	V	72	50-52	14.317	11.517
8	V	72	50-52	14.397	11.597
9	V	54	50-52	14.468	11.668
10	H	54	50-52	14.035	12.540
11	H	36	50-52	14.086	12.591
12	H	36	50-52	14.126	12.631
13	H	36	50-52	14.166	12.671
14	H	36	50-52	14.206	12.711
15	V	27	50-52	14.249	12.078 (TV America)
16	H	72	50-52	14.317	11.517*
17	H	72	50-52	14.397	11.597
18	H	46	50-52	14.464	11.664*
23	LHCP	27	56	17.327	12.149(DBS)
27	LHCP	27	56	17.404	12.226(DBS)
31	LHCP	27	56	17.480	12.302(DBS)
35	LHCP	27	56	17.557	12.379(DBS)
39	LHCP	27	56	17.634	12.456(DBS)

* Transponders 16 and 18 are uplink switchable. They can uplink either in Europe or in America.

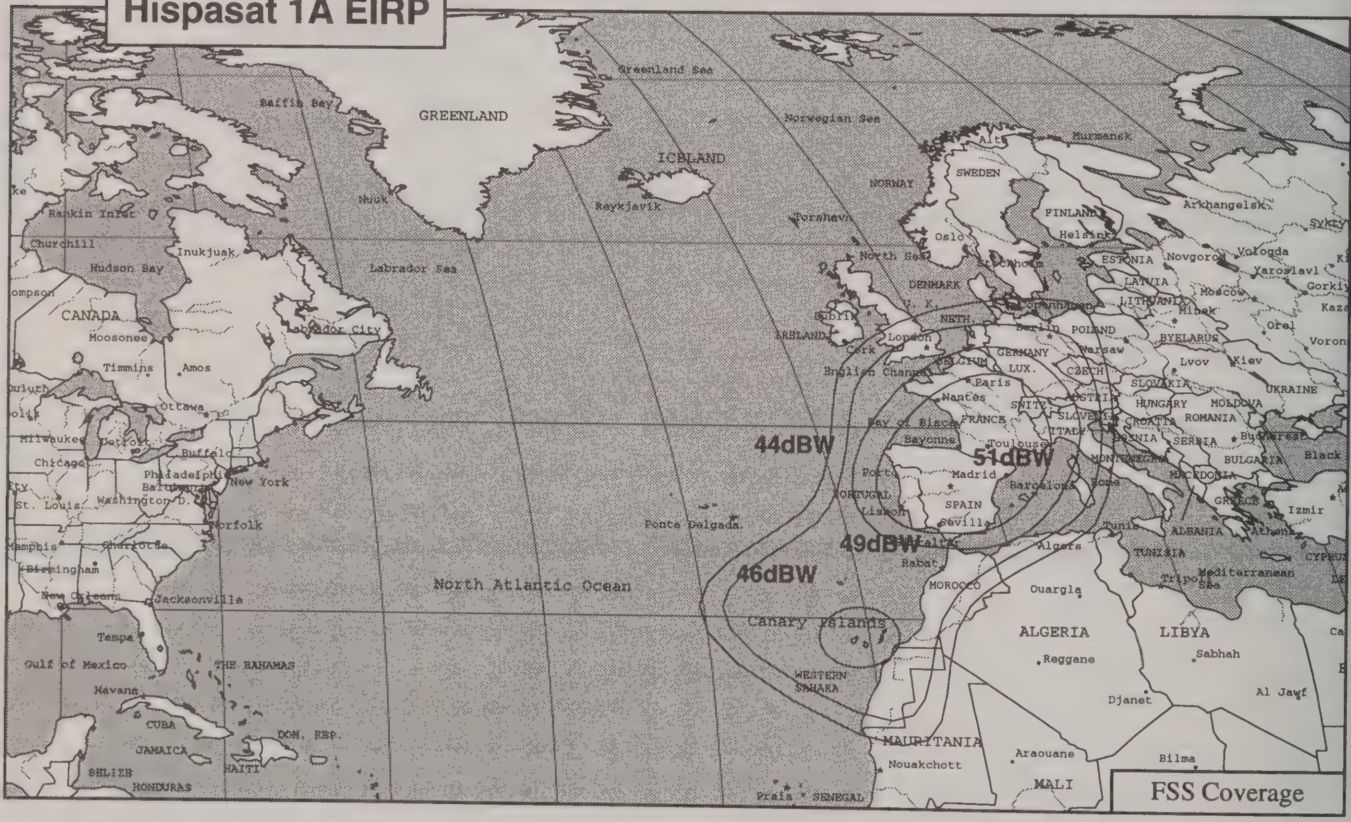
Hispasat 1A and 1B

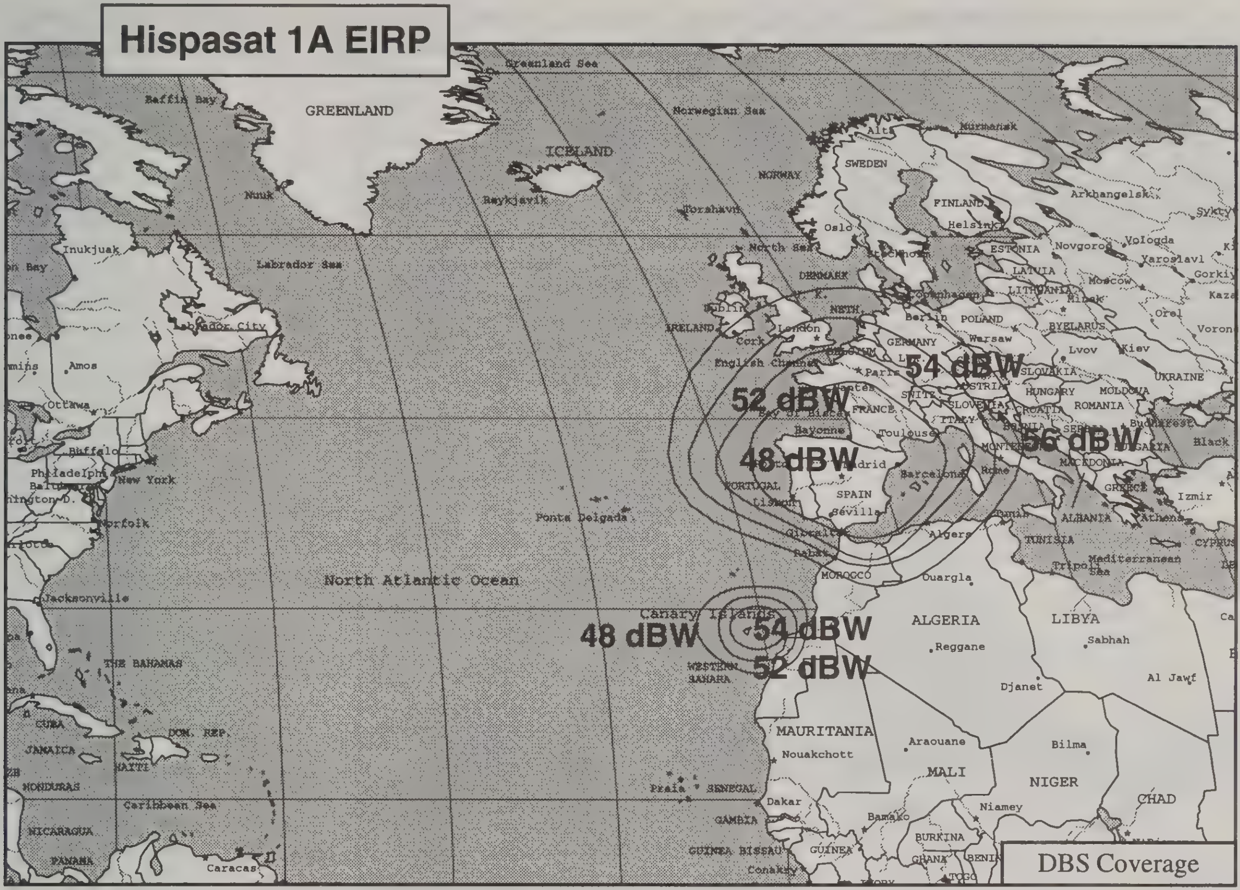
Orbital location: 330ºE (30°W)
Launch: September 20, 1992, Ariane 4 (1A);
July 22, 1993, Ariane 4 (1B)
Expected lifetime: 10 years
Expected end of life: 2002 (1A), 2003 (1B)

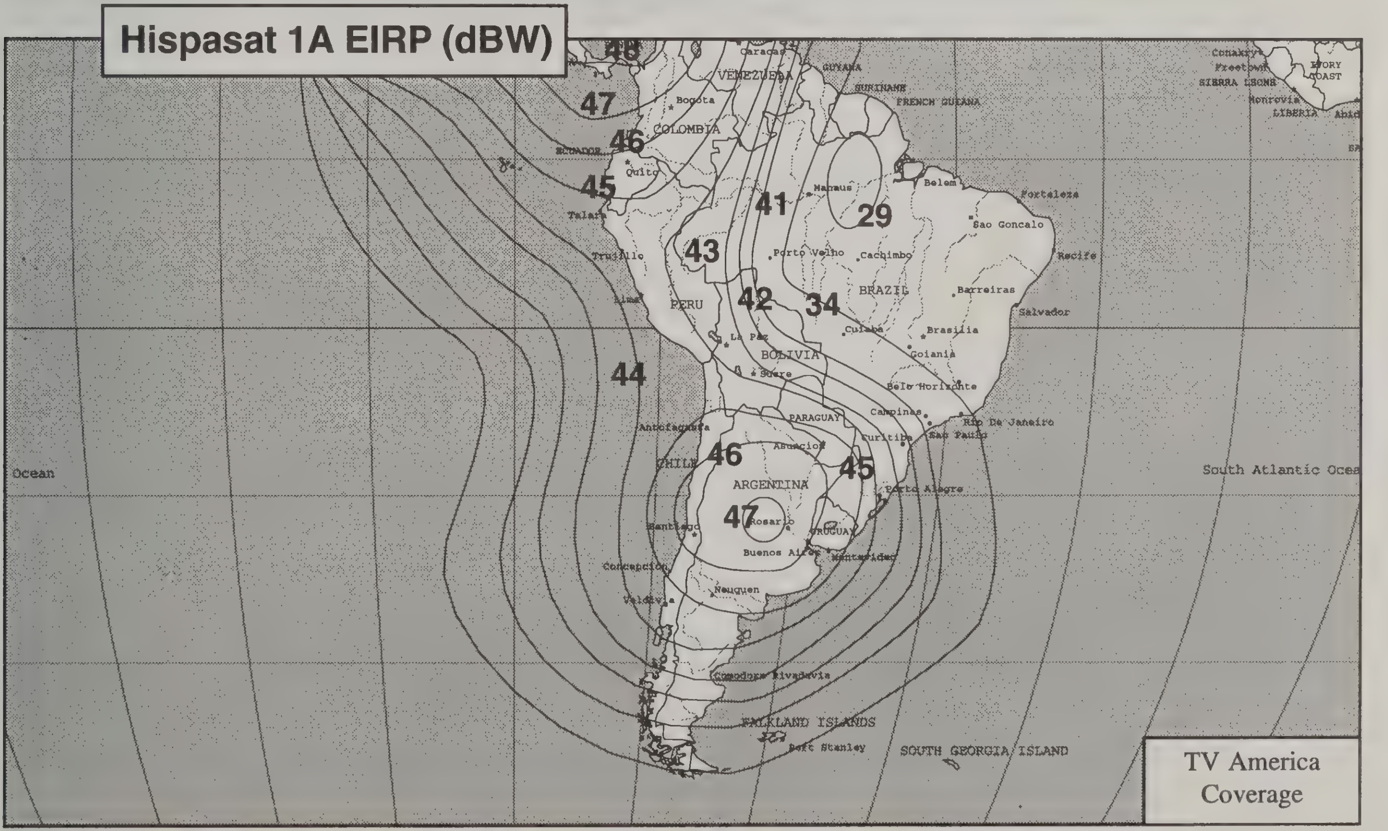
Antennas beam coverage overview:

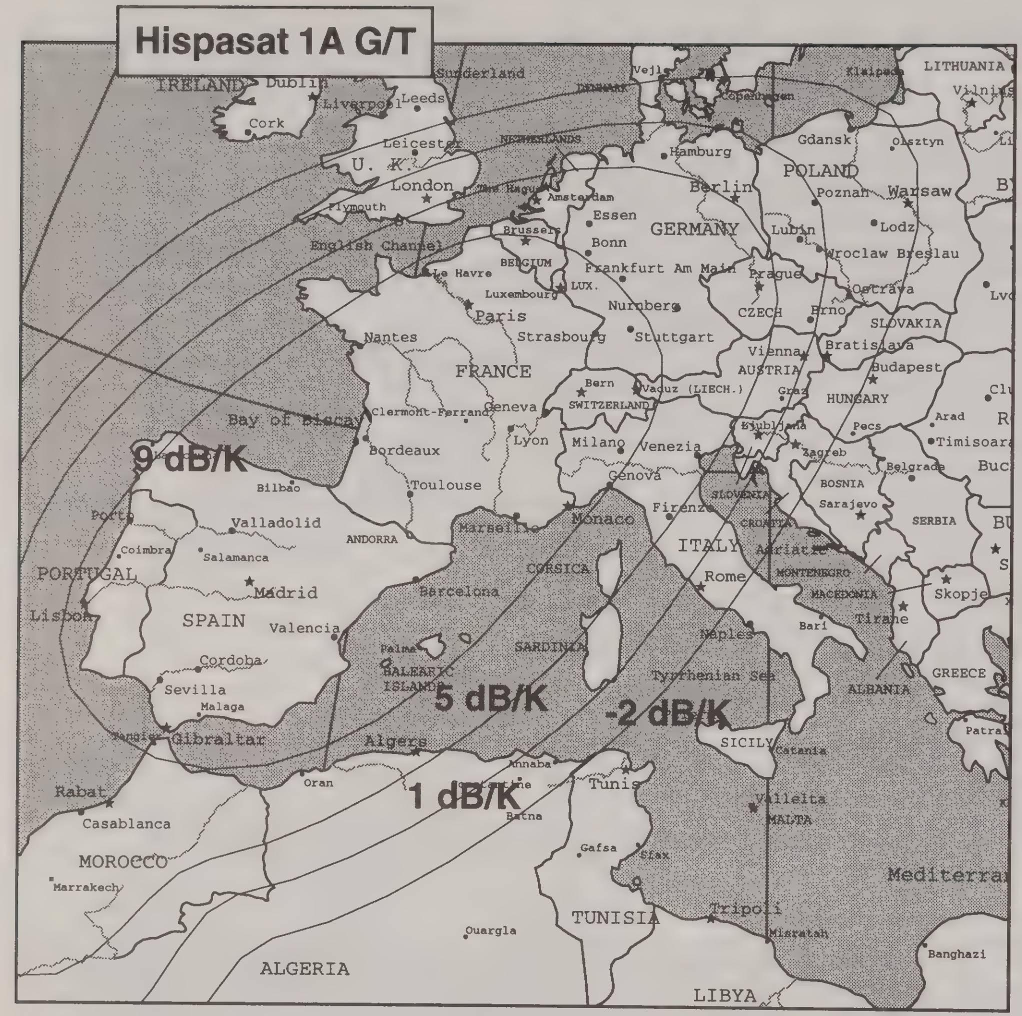
Spain, Canary Islands, the Americas

Hispasat 1A EIRP




Hispasat 1A EIRP
54 dBW
52 dBW
56 dBW
48 dBW
48 dBW
54 dBW
52 dBW
DBS Coverage
GREENLAND
ICELAND
North Atlantic Ocean
Canary Islands
SPAIN
PORTUGAL
FRANCE
MOROCCO
ALGERIA
LIBYA
MAURITANIA
MALI
NIGER
CHAD
Madrid
Lisbon
Barcelona
Paris
London


Hispasat 1A EIRP (dBW)
48
47
46
45
44
43
42
41
34
29
46
45
47
TV America Coverage
VENEZUELA
COLOMBIA
PERU
BRAZIL
BOLIVIA
PARAGUAY
CHILE
ARGENTINA
URUGUAY
FALKLAND ISLANDS
SOUTH GEORGIA ISLAND
South Atlantic Ocean
Ocean



Hispasat 1A G/T

SWEDISH SPACE CORPORATION

P.O. Box 4207
S-17104
SWEDEN

Telephone: +46 (8)627 6200
Facsimile: +46 (8)627 6364
Telex: 17128 SPACECO S

Booking Contact:

Anders Bjorkman, Tele-X Booking Manager

Overview:

Operates the Tele-X and the Sirius direct broadcast satellite systems, providing high-speed data, video communications and telecommunications to northern Europe.

Services Offered:

- Direct broadcast satellite services
- High-speed data
- Video
- Telecommunications

Satellite Control Network:

Satellite control:	Kiruna, Sweden
TT&C stations:	Kiruna, Sweden; Gotland, Sweden; Chilworth, United Kingdom

TELE-X SYSTEM At A Glance

Satellite name:	Tele-X, 5°E
Spacecraft data:	
Mass (in orbit, BOL):	1,277 kg
Primary power (EOL):	3,200 W
Stabilization:	3-axis
Launch date:	April 1989
Launch vehicle:	Ariane 2
Expected lifetime:	8 years
Transponders:	
Number:	5 (3 DBS)
Power output:	230 W TWTA
Polarization:	LHCP
Redundancy:	2 backups
Single carrier saturation flux density:	-106 to -76 dBW/sq.m.
Manufacturer:	Eurosatellite and Aerospatiale

Tele-X Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink (GHz)	Downlink(GHz)
26	LHCP	27	57	17.807	12.207
32	LHCP	27	57	17.922	12.322
40	LHCP	27	57	18.075	12.475
C1	LHCP	96	57	14.140	12.640
C1	LHCP	55	57	14.220	12.720

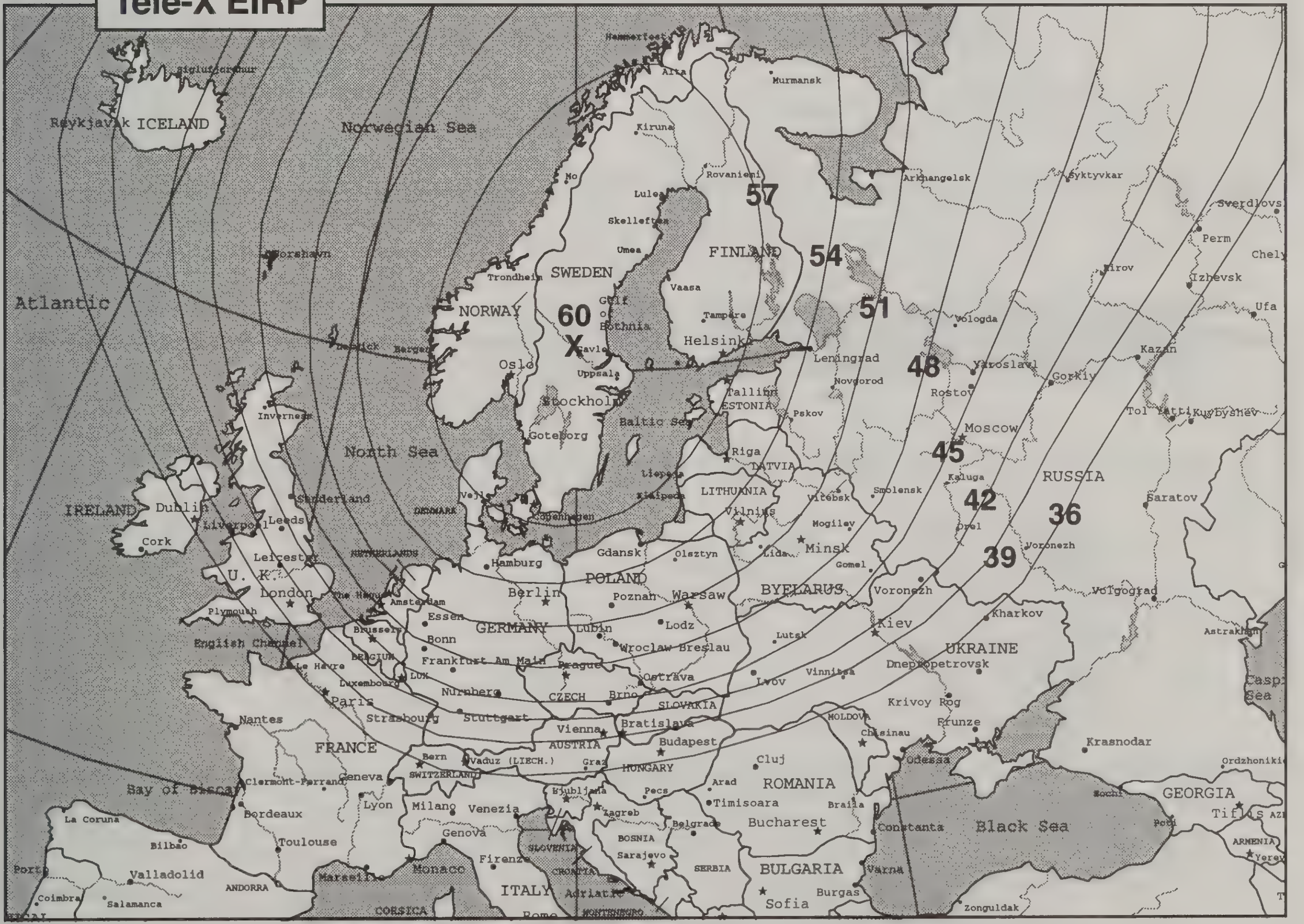
Tele-X

Orbital location: 5ºE
Launch: April 1989, Ariane 2
Expected lifetime: 8 years
Expected end of life: 1997

Antennas beam coverage overview:

DBS: Northern Europe

Tele-X EIRP



SIRIUS SYSTEM At A Glance

Satellite name:	Sirius 1, 5.2°E; Sirius 2, 5°E (to be launched)
Spacecraft data:	
Mass (in orbit, BOL):	660 kg
Primary power (EOL):	1,000 W
Eclipse protection:	Yes
Stabilization:	Spin
Launch date:	August 1989 (1); July 1997 (2)
Launch vehicle:	Atlas
Expected lifetime:	11 years
Transponders:	
Number:	5
Power output:	55 W
Polarization:	RHCP
Redundancy:	6 for 5 (total 12 TWT's)
Manufacturer:	Hughes

Sirius 1 Transponder Frequency Plan

Tr.#	Pol.	BW (MHz)	EIRP(dBW)	Uplink (GHz)	Downlink(GHz)
4	RHCP	27	56	17.385	11.785
8	RHCP	27	56	17.462	11.862
12	RHCP	27	56	17.538	11.938
16	RHCP	27	56	17.615	12.015
20	RHCP	27	56	17.692	12.092

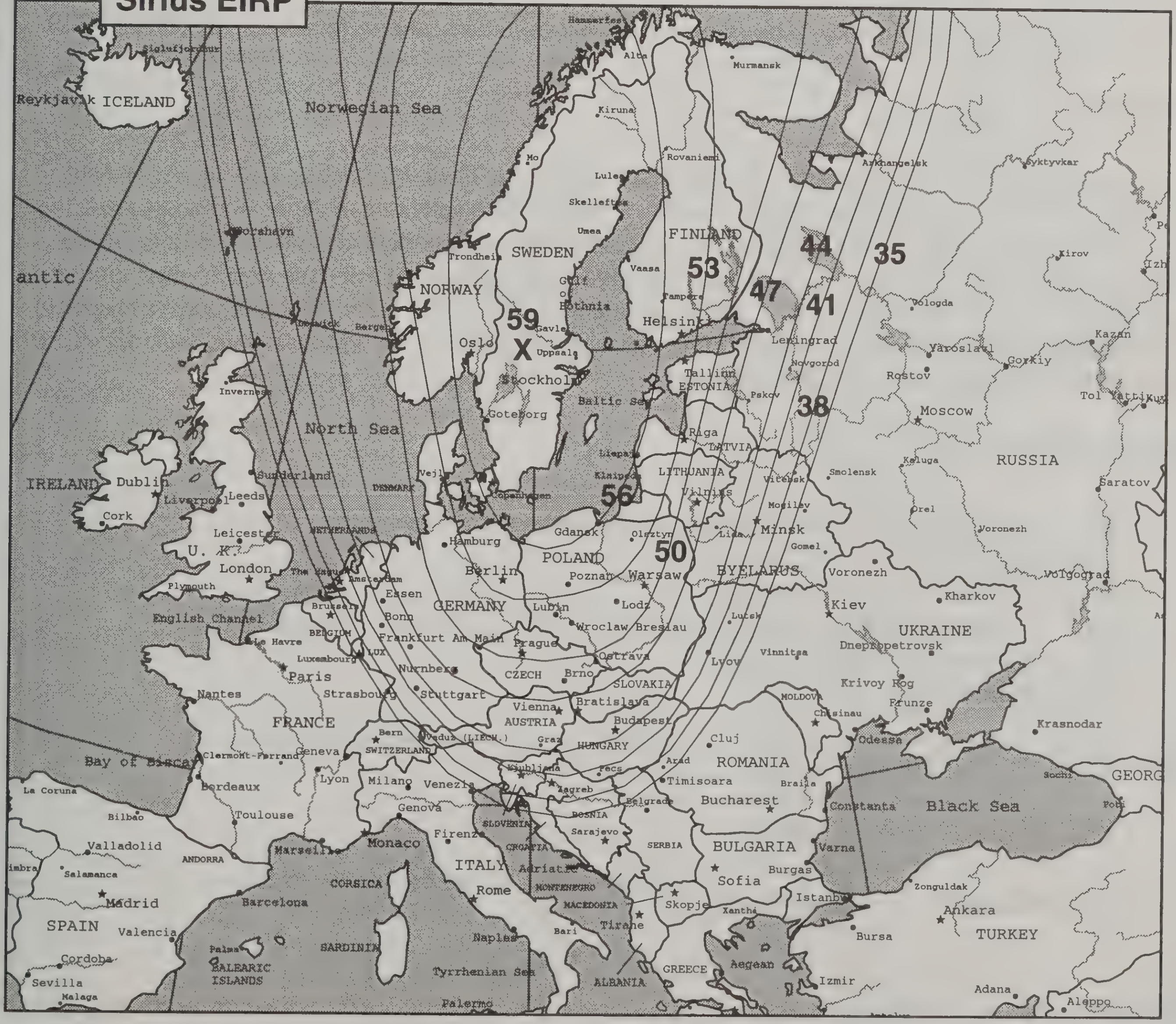
Sirius 1

Orbital location:	5.2ºE
Launch:	August 1989, Atlas
Expected lifetime:	11 years
Expected end of life:	2000

Antennas beam coverage overview:

DBS:	Northern Europe

Sirius EIRP



SHINAWATRA SATELLITE PUBLIC COMPANY LTD.

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THAILAND

Telephone: +66 591-0736 to 49
Facsimile: +66 591-0706

Contact:

Yongsit Rojsrivichaikul, Marketing and Sales Manager

Public Relations Contact:

Pariyanuch Hongsamrerng, Manager of Marketing Communications, facsimile +66 (2)591-0719

Overview:

Established in 1991, the company owns and operates the Thaicom satellite system. At present, Thaicom-1 and -2 are in operation. The C-band coverage on both satellites includes Southeast Asia, the east coast of China, Japan, Korea, and Taiwan. The Ku-band transponders also take advantage of the world's most advanced digital compression technology, creating Thailand's and the region's first digital direct broadcasting system. Thaicom-3, which has a launch date set for early 1997, will have a large and high-powered C-band and Ku-band transponder capacity compared to the other two satellites. Its global beam will have the footprint coverage that spans over Asia, Europe, Africa, and Australia.

Services Offered:

- Lease of transponders for full-time and occasional usage
- Direct broadcast satellite (DBS)
- Uplink and downlink service
- Satellite news gathering (SNG)
- Turnaround of satellite signal
- Tape play service

Satellite Control Network:

Satellite control: Nonthaburi

TT&C stations: Nonthaburi

THAICOM SYSTEM At A Glance

Satellite name:	Thaicom-1, 78.5°E*; Thaicom-2, 78.5°E; Thaicom-3, 78.5°E (to be launched); Thaicom-4, 78.5°E (to be launched)
Spacecraft data:	
Area of coverage:	Southeast Asia (Ku-band), Southeast Asia, east coast of China, Japan, Korea, and Taiwan (C-band) [T1, T2]; Southeast Asia and Inda (C-band regional beam), Asia, Europe, Africa, Australia (C-band global beam), Southeast Asia (Ku-band regional beam), can be pointed to any desired area within the coverage area (Ku-band steerable beam) [T3]
Mass (in orbit):	629 kg (T1, T2); 1,560 kg (T3)
Primary power (EOL):	700 W (T1, T2); 5,300 W (T3)
Stabilization:	Spin (T1, T2); 3-axis (T3)
Launch date:	December 18, 1993 (T1); October 8, 1994 (T2); April 11, 1997 (T3); TBA (T4)
Launch vehicle:	Ariane (T1, T2, T3)
Expected lifetime:	15 years (T1, T2); 14 years (T3)
Transponders:	
Number:	2 Ku-band, 54 MHz (+1 backup), 10 C-band, 36 MHz (+2 backups) [T1, T2] 24 C-band (36 MHz), 14 Ku-band (2 @ 54 MHz, 12 @ 36 MHz) [T3]
Power output:	47 W TWTA (Ku-band), 11 W SSPA (C-band) [T1, T2]; 97 W TWTA, 19 W 42 W SSPA (T3)
Polarization:	Linear
Uplink frequency:	14.3159-14.4951 GHz, 5.925-6.425 GHz (T1, T2); 5.925-6.725 GHz (C-band), 14.000-14.500 GHz (Ku-band) [T3]
Downlink frequency:	12.5679-12.7471 GHz, 3.7-4.2 GHz (T1, T2); 3.400-4.200 GHz (C-band), 12.250-12.750 GHz (Ku-band) [T3]

* To be relocated to 120°E after the launch of Thaicom-3

THAICOM SYSTEM At A Glance (continued)

Bandwidth:	54 MHz (Ku-band), 36 MHz (C-band) [T1, T2]; 500 MHz (Standard C-band), 300 MHz (Extended C-band), 500 MHz (Ku-band) [T3]
Uplink G/T:	8 dB/K (Ku-band), 5 dB/K (C-band) [T1, T2]; +4.0 dB/K (C-band regional), -7.0 dB/K (C-band global), +10 dB/K (Ku-band regional), +3.6 dB/K (Ku-band steerable) [T3]
EIRP:	51 dBW (Ku-band), 37 dBW (C-band, Thailand), 35 dBW (C-band, North Pacific) [T1, T2]; +37.0 dBW (C-band regional), +35 dBW (C-band global), +55 dBW (Ku-band regional), 50.0 dBW (Ku-band steerable) [T3]
Manufacturer:	Hughes Space and Communications (T1 and T2); Aerospatiale (T3)

Thaicom

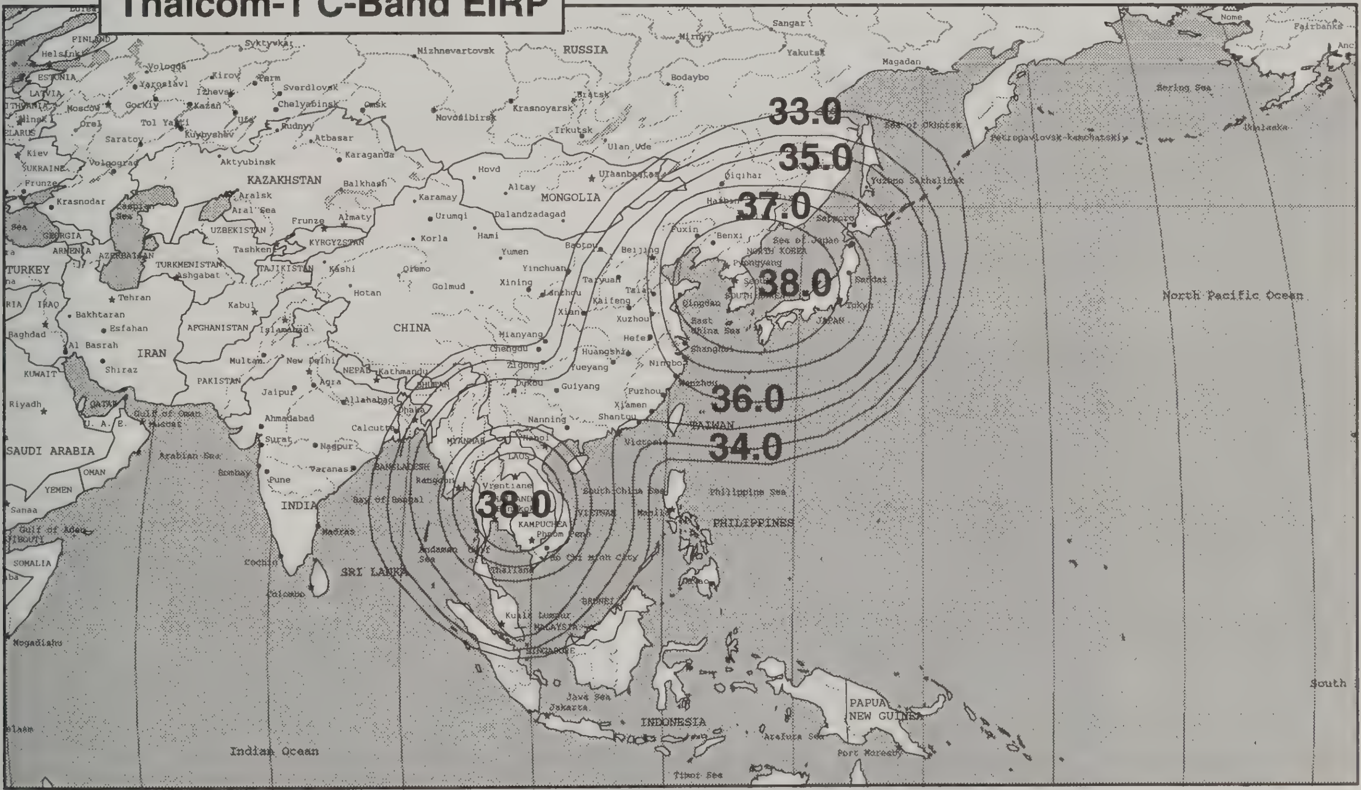
Orbital location: 78.5° (T1); 78.5°E (T2)
Launch: December 1993 (T1); October 1994 (T2)
Expected lifetime: 15 years
Expected end of life: 2008 (T1), 2009 (T2)

Antennas beam coverage overview:

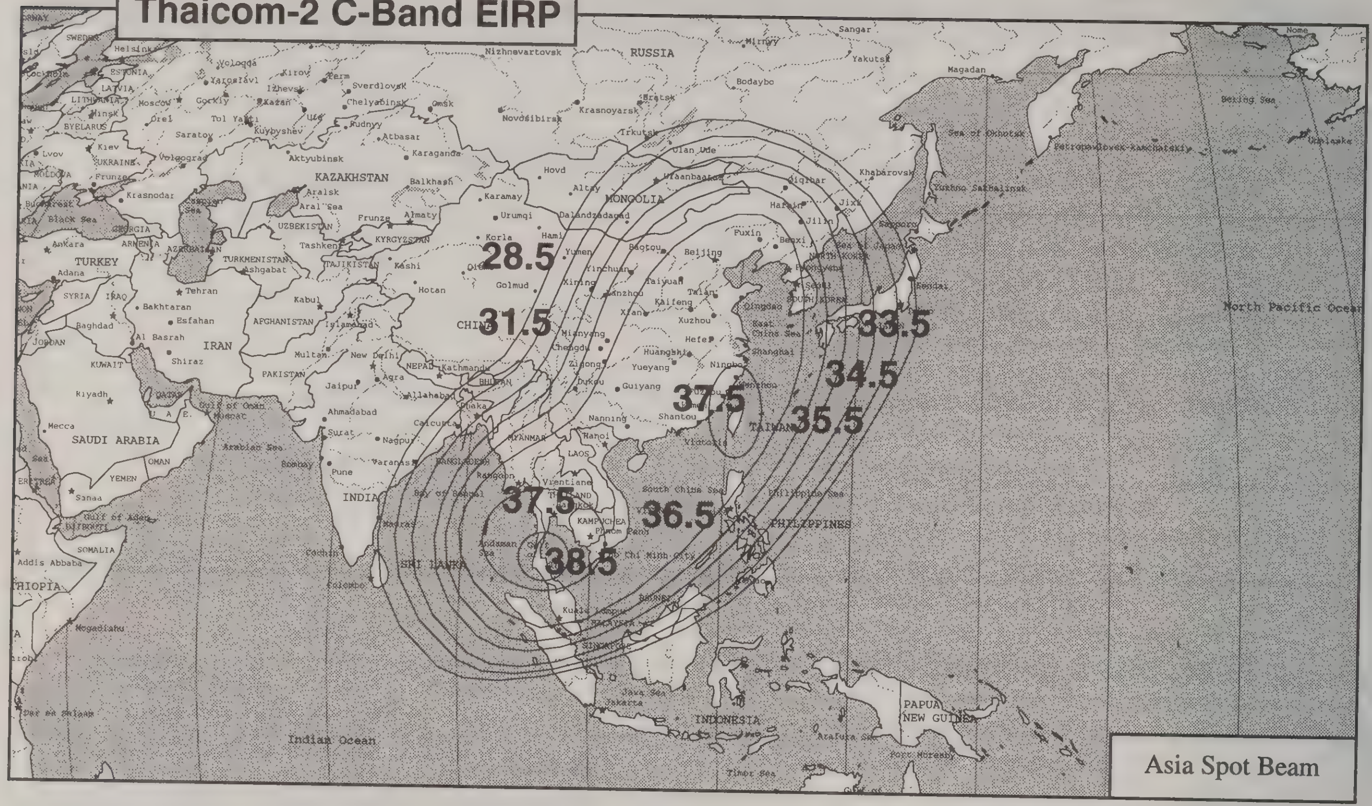
C-band: Southeast Asia, east coast of China, Japan, Korea, and Taiwan

Ku-band: Southeast Asia

Thaicom-1 C-Band EIRP



Thaicom-2 C-Band EIRP



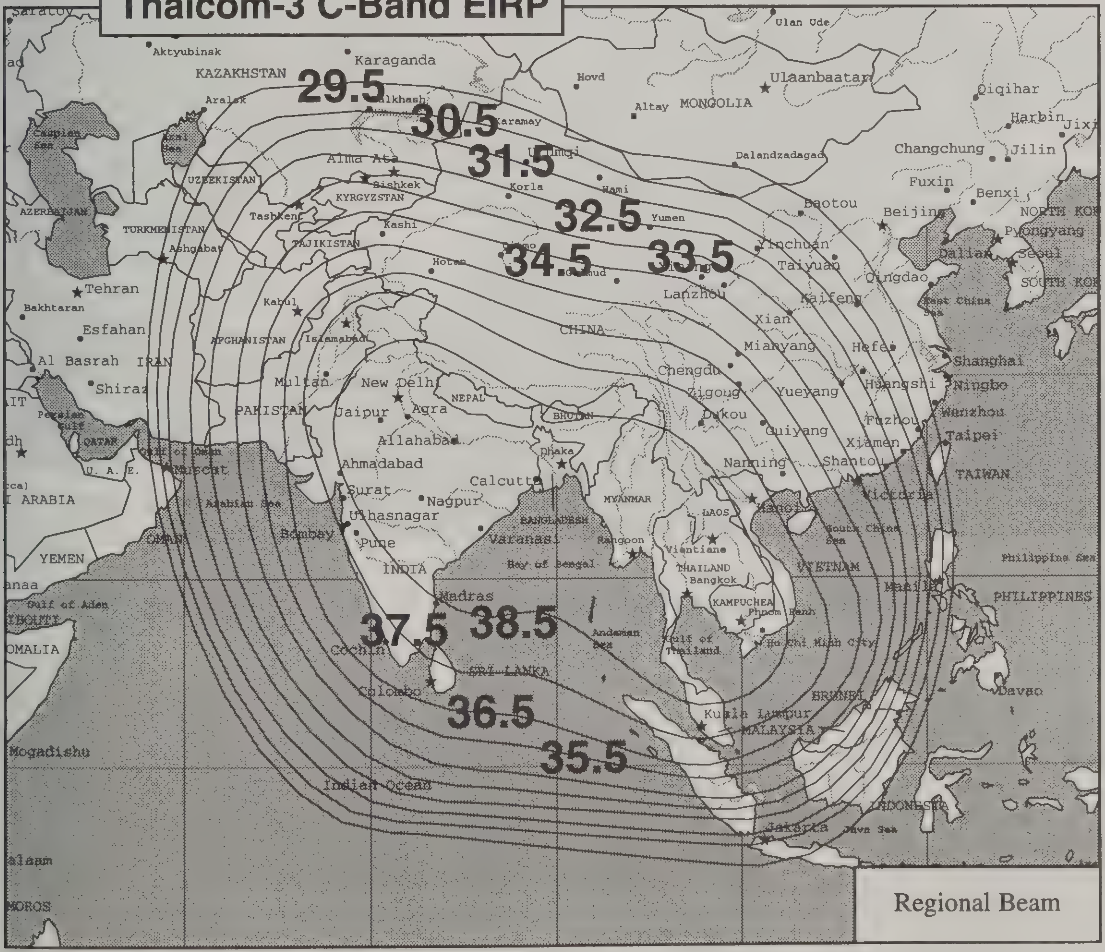
Thaicom-3

Orbital location:	78.5°
Launch:	April 11, 1997 (to be launched)
Expected lifetime:	14 years
Expected end of life:	2011

Antennas beam coverage overview:

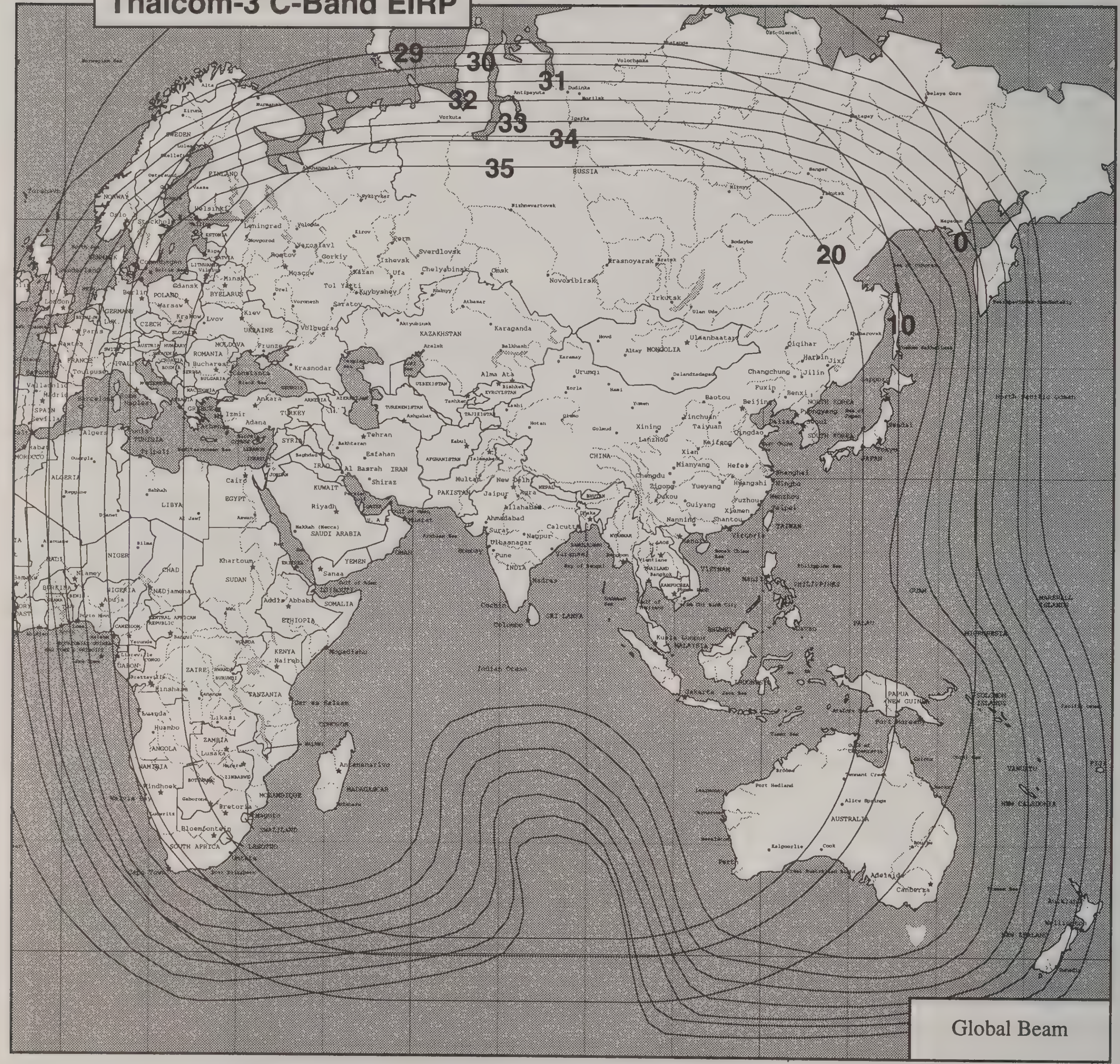
C-band:	Regional beam: Southeast Asia and India Global beam: Asia, Europe, Africa, and Australia
Ku-band:	Regional beam: Southeast Asia Steerable beam: Can be pointed to any desired area within the coverage area

Thaicom-3 C-Band EIRP



Regional Beam

Thaicom-3 C-Band EIRP



ALASCOM INC.

210 East Bluff Road
Anchorage, AK 99501-1100
USA

Telephone:	(907)264-7000
Facsimile:	(907)264-7027
Telex:	25112

Booking Contact:

Jeff Pearson, Sales Manager

Public Relations Contact:

Laurie Herman, Director of External Affairs

Overview:

Provides commercial and government communications services within Alaska and between Alaska and locations in Hawaii and the contiguous 48 states. Operates the Aurora satellite system.

Services Offered:

- Occasional-use transponder services, including partial transponder capacity and subcarrier channels
- Full-band broadcast 1.5 Mbps videoconferencing and program audio facilities for dedicated and occasional use
- Dedicated and dial-up data services
- Dedicated voice (OPX, FX, tie lines) and dial-up (MTS, WATS) services
- Transportable rapid deployment earth stations, for transmissions from remote sites
- Marine VHF and single-sideband communications services

Satellite Control Network:

Satellite control:	Eagle River, AK
TT&C stations:	Through GE Americom facilities; Vernon Valley, NJ; and South Mountain, CA

AURORA SYSTEM At A Glance

Satellite name:	Aurora II, 221°E (139°W)
Spacecraft data:	
Mass (in orbit):	736 kg
Primary power (EOL):	1,100 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	May 1991
Expected lifetime:	10.5 years
Transponders:	
Number:	24
Power output:	10 W SSPA
Polarization	Orthogonal linear
Redundancy:	.8:6
Uplink G/T:	+1 dB/°K
Single carrier saturation flux density:	Variable, 2dB steps -92 to -80 dBW/sq.m.
Manufacturer:	GE Astrospace

AURORA II Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	36	37*	5.945	3.720
2	H	36	40**	5.965	3.740
3	V	36	37*	5.985	3.760
4	H	36	40**	6.005	3.780
5	V	36	37*	6.025	3.800
6	H	36	40**	6.045	3.820
7	V	36	37*	6.065	3.840
8	H	36	40**	6.085	3.860
9	V	36	37*	6.105	3.880
10	H	36	40**	6.125	3.900
11	V	36	37*	6.145	3.920
12	H	36	40**	6.165	3.940
13	V	36	37*	6.185	3.960
14	H	36	40**	6.205	3.980
15	V	36	37*	6.225	4.000
16	H	36	40**	6.245	4.020
17	V	36	37*	6.265	4.040
18	H	36	40**	6.285	4.060
19	V	36	37*	6.305	4.080
20	H	36	40**	6.325	4.100
21	V	36	37*	6.345	4.120
22	H	36	40**	6.365	4.140
23	V	36	37*	6.385	4.160
24	H	36	40**	6.405	4.180

* Conus; Alaska: 38 dBW; Puerto Rico: 28 dBW; Virgin Islands: 27 dBW; Hawaii: 29 dBW

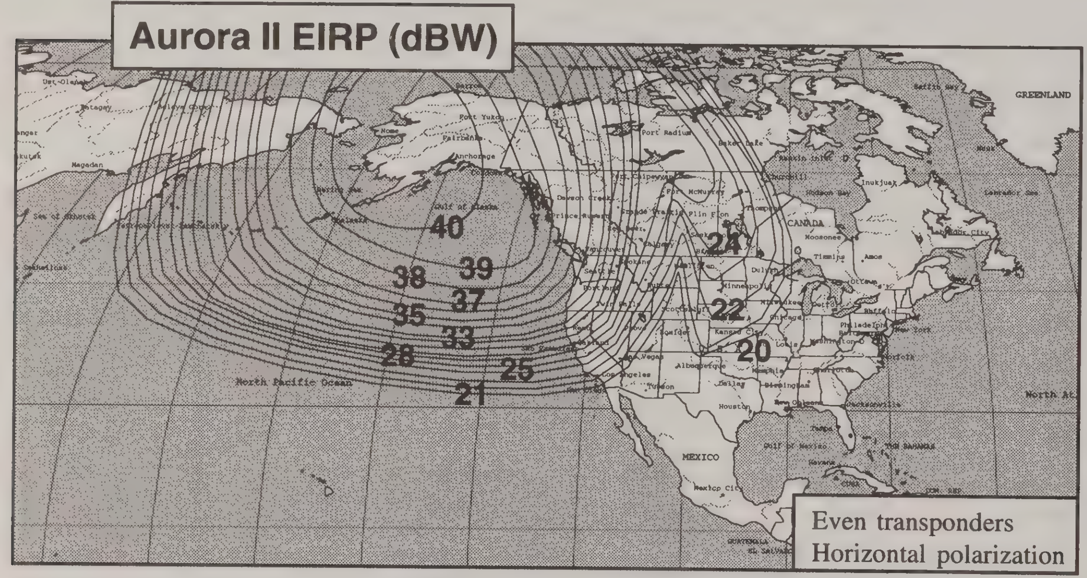
** Even transponders, Alaskan spot beams.

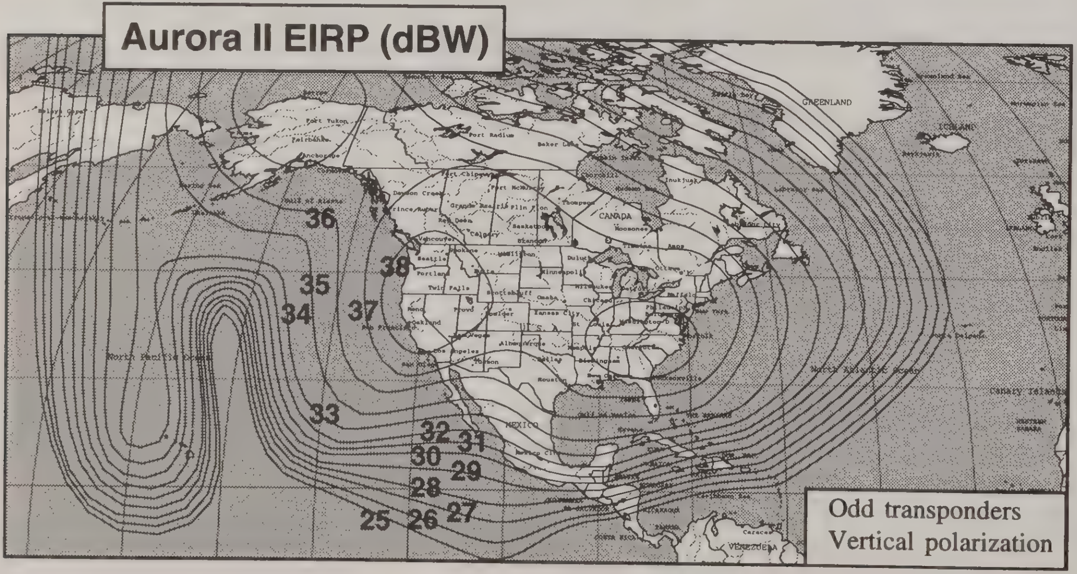
AURORA II

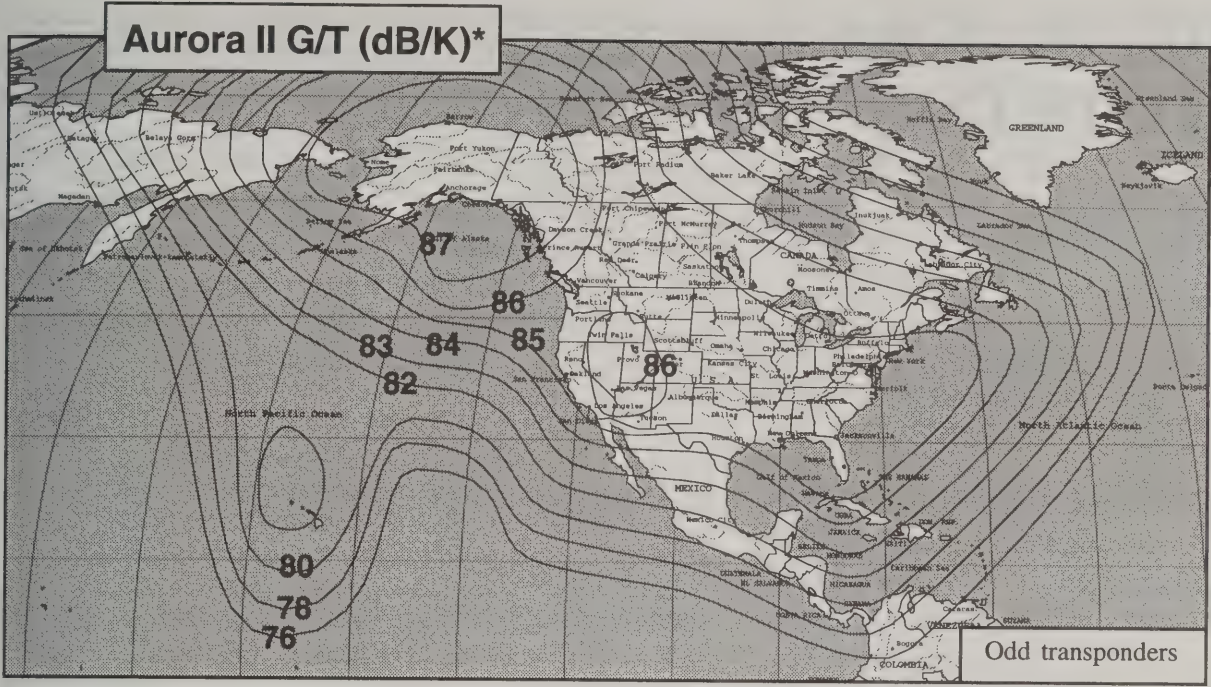
Orbital location:	221°E (139°W)
Launch:	May 1991, Delta 3924
Expected lifetime:	10.5 years
Expected end of life:	2001

Antennas beam coverage overview:

C-band:	Conus, Puerto Rico, Virgin Islands

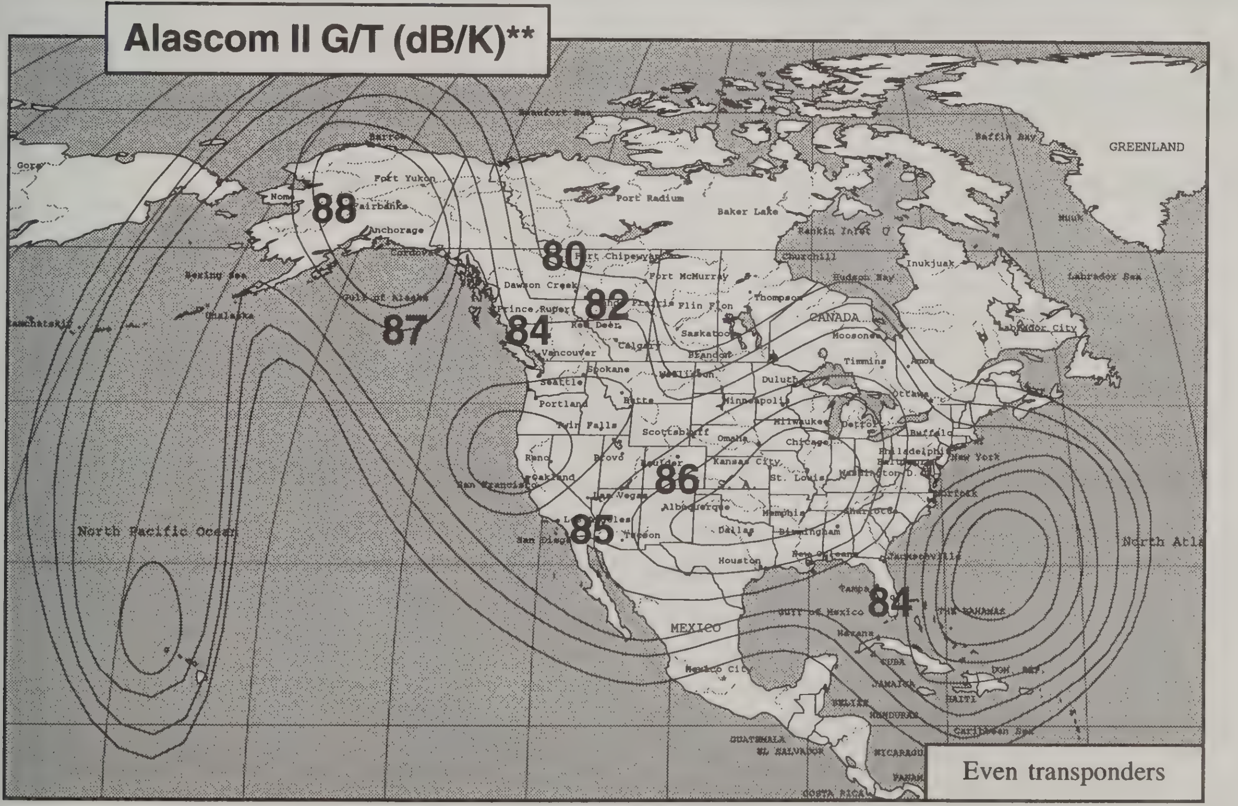






Aurora II G/T (dB/K)*

* These maps represent Flux to Saturate (FTS) contours. G/T figures can be calculated: G/T = -86.5 - FTS



Alascom II G/T (dB/K)**

** These maps represent Flux to Saturate (FTS) contours. G/T figures can be calculated: G/T = -86.8 - FTS

AMERICAN MOBILE SATELLITE CORPORATION (AMSC)

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USA

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Corporate E-mail:	info@skycell.com
Web Site Address:	www.skycell.com

Contacts:

Gary M. Parsons, President and Chief Executive Officer
Brian Pemberton, President of Skycell Services
Patrick Fitzpatrick, Vice President and Chief Financial Officer
Orly König-Lopez, Manager of Corporate Communications

Overview:

American Mobile Satellite Corporation offers a full range of mobile communications including telephone, digital broadcast dispatch, data and position reporting services. The AMSC-1 satellite provides coverage over the continental United States, Alaska, Hawaii, Puerto Rico, the Virgin Islands, and hundreds of miles of US coastal waters. AMSC's shareholders include Hughes Communications Inc., Singapore Telecom and AT&T Wireless Services.

Services Offered:

- Voice
- High speed data
- Facsimile
- Nationwide voice dispatch
- Position location

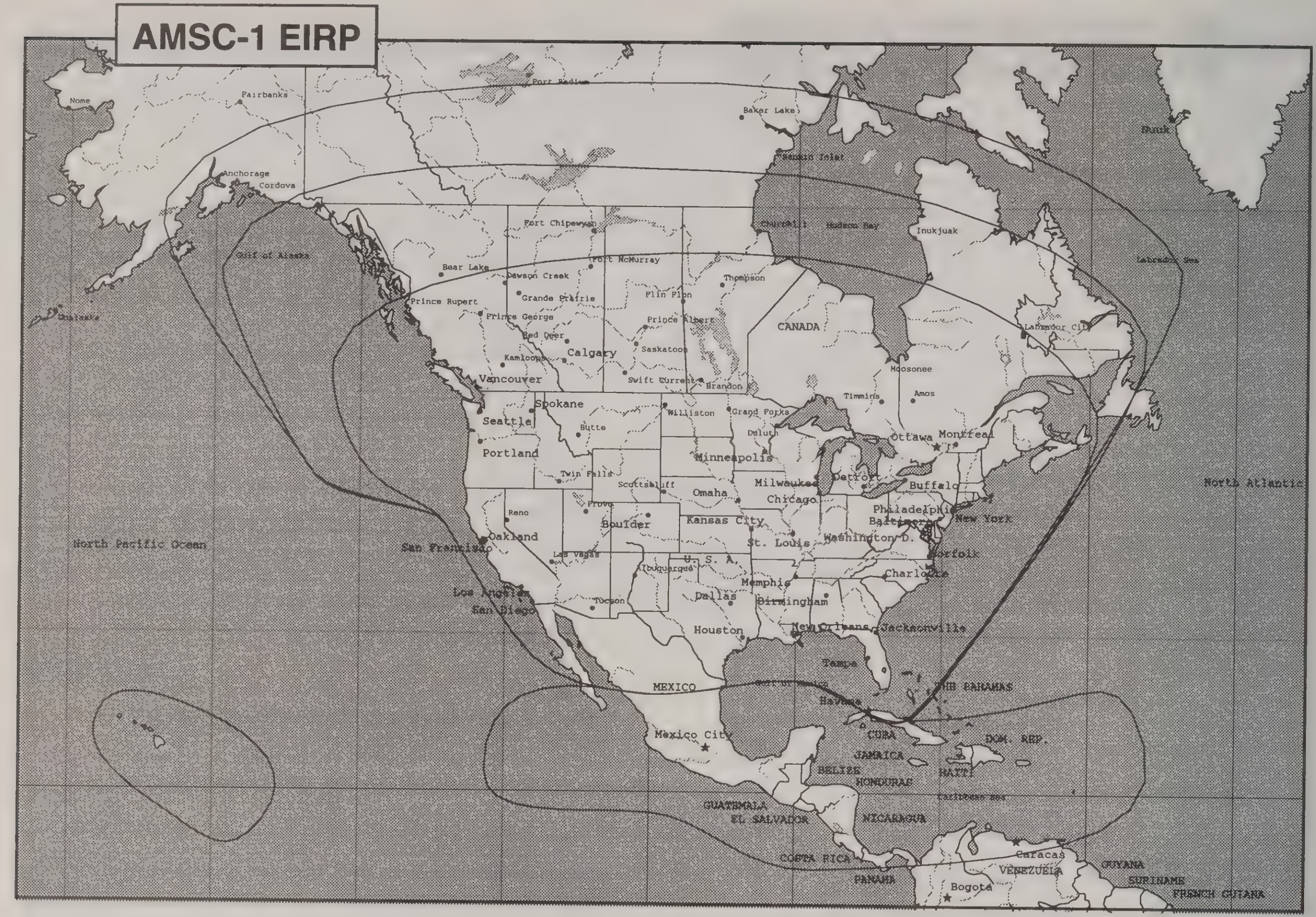
AMSC SYSTEM At A Glance

- Satellite name: AMSC-1, 259°E (1°W)
- Spacecraft data:
  - Area of coverage: 5 spot beams covering the continental United States, Alaska, Hawaii, Puerto Rico, US Virgin Islands, and hundreds of miles of coastal waters
  - Antennas: two 22-by-16 foot elliptical unfurlable mesh springback (L-band), one 30 inch shaped reflector antenna
  - Mass (in orbit): 1,600 kg
  - Primary power (EOL): 3,000 W
  - Eclipse protection: 50%
  - Stabilization: 3-axis stabilized
  - Launch date: April 7, 1995
  - Launch vehicle: Lockheed Martin Atlas IIA
  - Expected lifetime: 12 years

  - Transponders:
    - Frequency band: L-band (mobile), Ku-band (fixed site)
    - Uplink frequency: 1.6315-1.6605 GHz (L-band),
13.0-13.5, 13.2-13.25 GHz (Ku-band)
    - Downlink frequency: 1.530-1.559 GHz (L-band),
10.75-10.95 GHz (Ku-band)
    - RF power levels: 56.6 dBW (L-band), 36.0 dBW (Ku-band)
    - Polarization: RHCP for L-band
    - G/T: 3.2 dB/K (L-band), -3.6 dB/K (Ku-band)
    - Receive G/T: L-band: Basic service area +2.7 dB/K; Alaska/Hawaii -1.0 dB/K; Mexico/Puerto Rico -2.3 dB/K; Ku-band: Basic service area -3.6 dB/K; Alaska/Hawaii -6.3 dB/K; Mexico/Puerto Rico: -6.9 dB/K

  - Single carrier saturation flux density: -150 dBW/sq.m.

  - Manufacturer: Hughes Space & Communications



AMSC-1 EIRP

Nome
Fairbanks
Port Radium
Baker Lake
Anchorage
Cordova
Rankin Inlet
Gulf of Alaska
Port Chipewyan
Churchill
Hudson Bay
Inukjuak
Labrador Sea
Bear Lake
Fort McMurray
Dawson Creek
Thompson
Flin Flon
Grande Prairie
Prince Rupert
Prince George
Prince Albert
CANADA
Labrador City
Unalaska
Red Deer
Calgary
Saskatoon
Kamloops
Moosonee
Vancouver
Swift Current
Brandon
Timmins
Amos
Spokane
Williston
Grand Forks
Seattle
Butte
Duluth
Ottawa
Montreal
Portland
Minneapolis
Twin Falls
Scottsbluff
Milwaukee
Detroit
Buffalo
North Atlantic
Omaha
Chicago
Provo
Reno
Philadelphia
Boulder
Kansas City
Baltimore
New York
Oakland
North Pacific Ocean
San Francisco
St. Louis
Washington D.C.
Norfolk
Las Vegas
U. S. A.
Albuquerque
Memphis
Charlotte
Los Angeles
Dallas
Birmingham
Tucson
San Diego
Houston
New Orleans
Jacksonville
Tampa
MEXICO
THE BAHAMAS
Havana
CUBA
Mexico City
DOM. REP.
JAMAICA
BELIZE
HAITI
HONDURAS
Caribbean Sea
GUATEMALA
EL SALVADOR
NICARAGUA
COSTA RICA
Caracas
PANAMA
VENEZUELA
GUYANA
SURINAME
Bogota
FRENCH GUIANA
Nuuk

COMSAT CORPORATION

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Bethesda, MD 20817
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Telephone: (301)214-3000
Facsimile: (301)214-7100

Booking Contact:

Walter S. McKee, Sr., Director, Satellite Control Center, (301)428-2000

Public Relations Contact:

Elizabeth McLean, Director of Corporate Communications

Overview:

Owns and operates a domestic C-band satellite system (Comstar D4). Provides international satellite services for communications between the United States and overseas points using the Intelsat and Inmarsat networks. As the US signatory to both consortiums, it offers a variety of voice, data, facsimile, and video services to US international service carriers and the broadcast, aeronautical, international land-mobile, and maritime communities. Furnishes domestic video services through the Comstar satellites.

Services Offered:

- Voice, data and facsimile
- Broadcast video
- Occasional aeronautical and maritime satellite services
- Occasional-use, full-period lease on C- and Ku-band domestic satellites
- Digital audio distribution services
- Integration of information and telecommunications systems and networks

Satellite Control Network:

Satellite control:	Clarksburg, MD
TT&C stations:	Southbury, CT; Santa Paula, CA; Clarksburg, MD

COMSTAR SYSTEM At A Glance

Satellite name: Comstar D4, 284°E (76°W), inclined orbit

Spacecraft data:

- Mass: 790 kg (initial on-station)
- Primary power (EOL): 610 W
- Eclipse protection: 100%
- Stabilization: Spin
- Launch date: February 1981
- Launch vehicle: Atlas Centaur
- Expected lifetime: 7 years (exceeded)

Transponders:

- Number: 24
- Power output: 5.5 W TWTA
- Polarization: Linear
- Redundancy: None

Single carrier saturation flux density: -81.80 dBW/m^2

Manufacturer: Hughes

Comstar D4 Transponder Frequency Plan

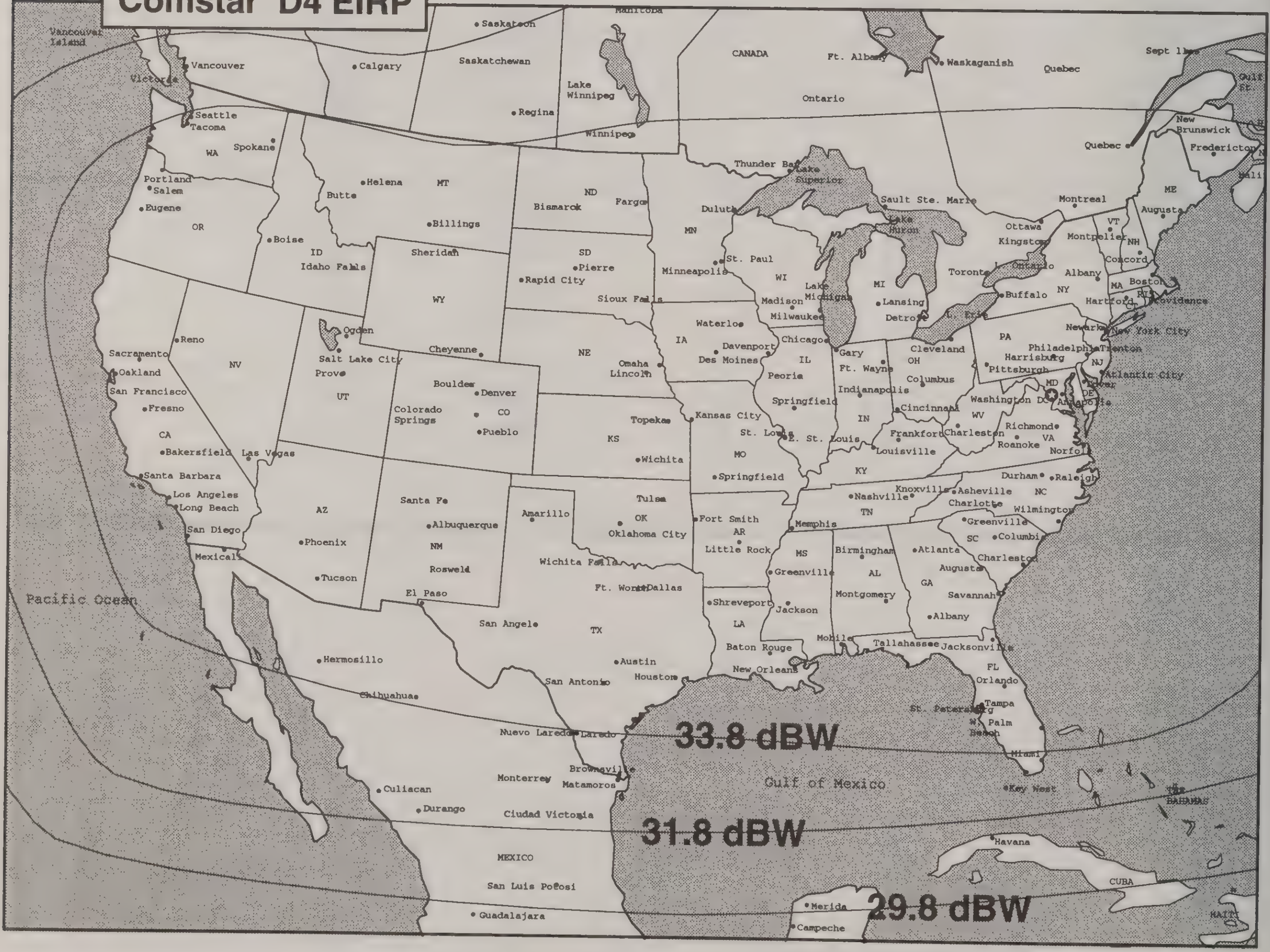
Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1[1]	V	34	33	5.945	3.720
1[2]	H	34	33	5.965	3.740
2[3]	V	34	33	5.985	3.760
2[4]	H	34	33	6.005	3.780
3[5]	V	34	33	6.025	3.800
3[6]	H	34	33	6.045	3.820
4[7]	V	34	33	6.065	3.840
4[8]	H	34	33	6.085	3.860
5[9]	V	34	33	6.105	3.880
5[10]	H	34	33	6.125	3.900
6[11]	V	34	33	6.145	3.920
6[12]	H	34	33	6.165	3.940
7[13]	V	34	33	6.185	3.960
7[14]	H	34	33	6.205	3.980
8[15]	V	34	33	6.225	4.000
8[16]	H	34	33	6.245	4.020
9[17]	V	34	33	6.265	4.040
9[18]	H	34	33	6.285	4.060
10[19]	V	34	33	6.305	4.080
10[20]	H	34	33	6.325	4.100
11[21]	V	34	33	6.345	4.120
11[22]	H	34	33	6.365	4.140
12[23]	V	34	33	6.385	4.160
12[24]	H	34	33	6.405	4.180

Comstar D4

Orbital location:	284°E (76°W)
Launch:	February 1981, Atlas Centaur
Expected lifetime:	7 years (exceeded)
Expected end of lifetime:	1999

Antenna beam coverage overview:

C-band:	Conus, Puerto Rico



Comstar D4 EIRP

DIRECTV INC. — A UNIT OF HUGHES ELECTRONICS CORPORATION

2230 East Imperial Highway		Telephone:	(310)726-4656
El Segundo, CA 90245		Facsimile:	(310)535-5225
USA		Web Site Address:	www.directv.com

Contacts:

Eddy W. Hartenstein, President
James B. Ramo, Executive Vice President
L. William Butterworth, Executive Vice President
Thomas M. Bracken, Vice President of Communications
Bob Marsocci, Public Affairs and Marketing

Overview:

DirecTV operates the United States' premiere direct broadcast satellite (DBS) television entertainment system, called DirectTV®. Up to 150 channels of compressed digital video and audio subscription entertainment is available at consumers' homes equipped with the DSS® satellite receiving system. DSS® equipment includes an 18-inch satellite dish, digital receiver and remote control. Three satellites each feature 16 120-watt Ku-band transponders with DBS-2 and -3 configured to provide 8 transponders at 240 watts each. Programming is uplinked to satellites from the DirecTV Castle Rock Broadcast Center in Castle Rock, CO. Satellites are operated by Hughes Communications Inc.'s Operations Control Center in El Segundo, CA.

Services Offered:

- Cable program packages
- Direct Ticket™ pay-per-view movies, sports and special events
- Out-of-market sports and major sports attractions
- Special interest programs

Services Proposed:

- Interactive TV and services

DBS SYSTEM At A Glance

Satellite name:	DBS-1, 258.8°E (101.2°W); DBS-2, 259.25°E (100.75°W); DBS-3, 259.1°E (100.9°W)
Spacecraft data:	
Area of coverage:	Conus
Mass (in orbit):	1,725 kg (1); 1,591 kg (2, 3)
Stabilization:	3-axis
Launch date:	December 17, 1993 (1); August 2, 1994 (2); June 9, 1995 (3)
Launch vehicle:	Ariane 4 (1, 3); Atlas IIA (2)
Expected lifetime:	12 years (nominal)
Transponders:	
Number:	16 Ku-band (11 DirecTV, 5 USSB)
Manufacturer:	Hughes Space and Communications

ECHOSTAR COMMUNICATIONS CORPORATION

90 Inverness Circle East
P.O. Box 6552
Englewood, CO 80155
USA

Telephone:	(303)799-8222
Facsimile:	(303)799-6222
Web Site Address:	www.echostar.com
Telex:	882033 ECHOTEL

Booking Contact:

Bill Vanderpoel, Vice President of New Business

Public Relations Contact:

Tom Kaser, Media Relations Specialist

Overview:

EchoStar Communications Corporation is a manufacturer and distributor of satellite television systems worldwide. Over 150 channels of digital video, audio and data services are delivered to homes throughout the continental United States since the launch of EchoStar II in September 1996. EchoStar and its subsidiaries deliver direct-to-home (DTH) satellite television products and services to customers worldwide. The company provides equipment distribution, sales, installation, and service; consumer financing; programming distribution; and research and development activities.

Services Offered:

- DBS
- Subscription television and pay-for-view services
- HDTV
- Data
- Video games
- Music and CD audio

ECHOSTAR SYSTEM At A Glance

Satellite name:	EchoStar-I, 241°E (119°W); EchoStar-II, 241°E (119°W); EchoStar-III, 241°E (119°W) [to be launched]; EchoStar-IV, 328°E (32°W) [to be launched]
Spacecraft data:	
Area of coverage:	Conus
Mass (in orbit):	1,500 kg
Primary power (EOL):	5,000 W
Eclipse protection:	100%
Stabilization:	3-axis
Launch date:	December 28, 1995 (I), September 10, 1996 (II), September 1997 (III), March 1998 (IV)
Launch vehicle:	Long March (I), Ariane 4 (II), Atlas IIAS (III)
Expected lifetime:	15 years
Transponders:	
Number:	16 Ku-band
Power output:	130 W TWTA
Polarization:	RHCP
Uplink frequency:	17.3-17.8 GHz
Downlink frequency:	12.2-12.7GHz
Bandwidth:	24 MHz
Redundancy:	24:16
Manufacturer:	Martin Marietta Astro Space

EchoStar Wideband Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1	Linear	54	14.029	11.729
2	Linear	54	14.0585	11.7585
3	Linear	54	14.088	11.788
4	Linear	54	14.1175	11.8175
5	Linear	54	14.147	11.847
6	Linear	54	14.1765	11.8765
7	Linear	54	14.206	11.906
8	Linear	54	14.2355	11.9355
9	Linear	54	14.265	11.965
10	Linear	54	14.2945	11.9945
11	Linear	54	14.324	12.024
12	Linear	54	14.3535	12.0535
13	Linear	54	14.383	12.083
14	Linear	54	14.4125	12.1125
15	Linear	54	14.442	12.142
16	Linear	54	14.4715	12.1715

EchoStar Narrowband Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1A	Linear	27	14.024	11.724
1B	Linear	27	14.03858	11.73858
2A	Linear	27	14.06774	11.76774
2B	Linear	27	14.05316	11.75316
3A	Linear	27	14.08232	11.78232
3B	Linear	27	14.0969	11.7969
4A	Linear	27	14.12606	11.82606
4B	Linear	27	14.11148	11.81148
5A	Linear	27	14.14064	11.84064
5B	Linear	27	14.15522	11.85522
6A	Linear	27	14.18438	11.88438
6B	Linear	27	14.1698	11.8698
7A	Linear	27	14.19896	11.89896
7B	Linear	27	14.21354	11.91354
8A	Linear	27	14.2427	11.9427
8B	Linear	27	14.22812	11.92812
9A	Linear	27	14.25728	11.95728
9B	Linear	27	14.27186	11.97186
10A	Linear	27	14.30102	12.00102
10B	Linear	27	14.28644	11.92812
11A	Linear	27	14.3156	12.0156
11B	Linear	27	14.33018	12.03018
12A	Linear	27	14.35934	12.05934
12B	Linear	27	14.34476	12.04476
13A	Linear	27	14.37392	12.07392
13B	Linear	27	14.3885	12.0885
14A	Linear	27	14.41766	12.11766
14B	Linear	27	14.40308	12.10308
15A	Linear	27	14.43224	12.13224
15B	Linear	27	14.44682	12.14682
16A	Linear	27	14.47598	12.17598
16B	Linear	27	14.4614	12.1614

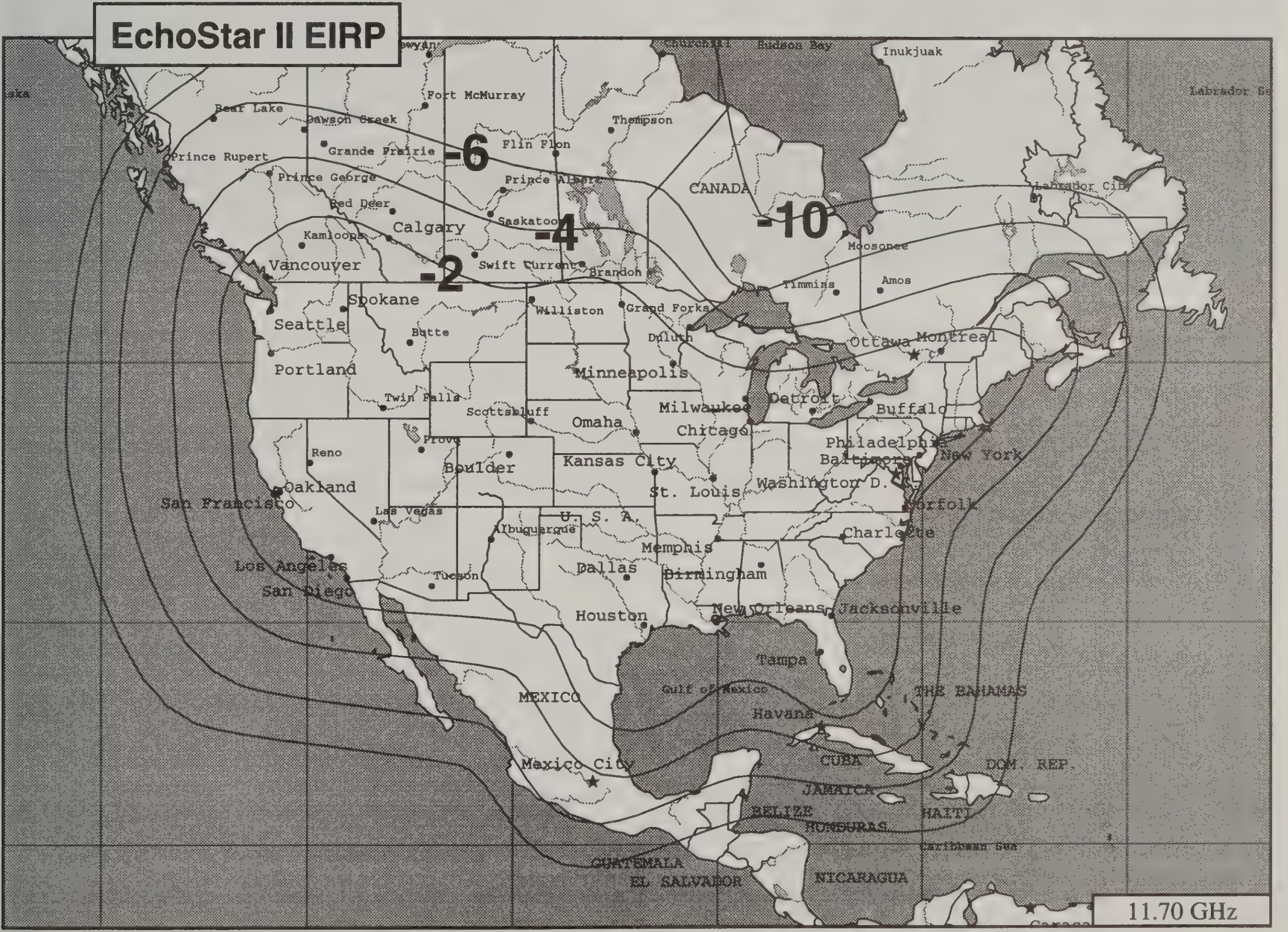
EchoStar-II

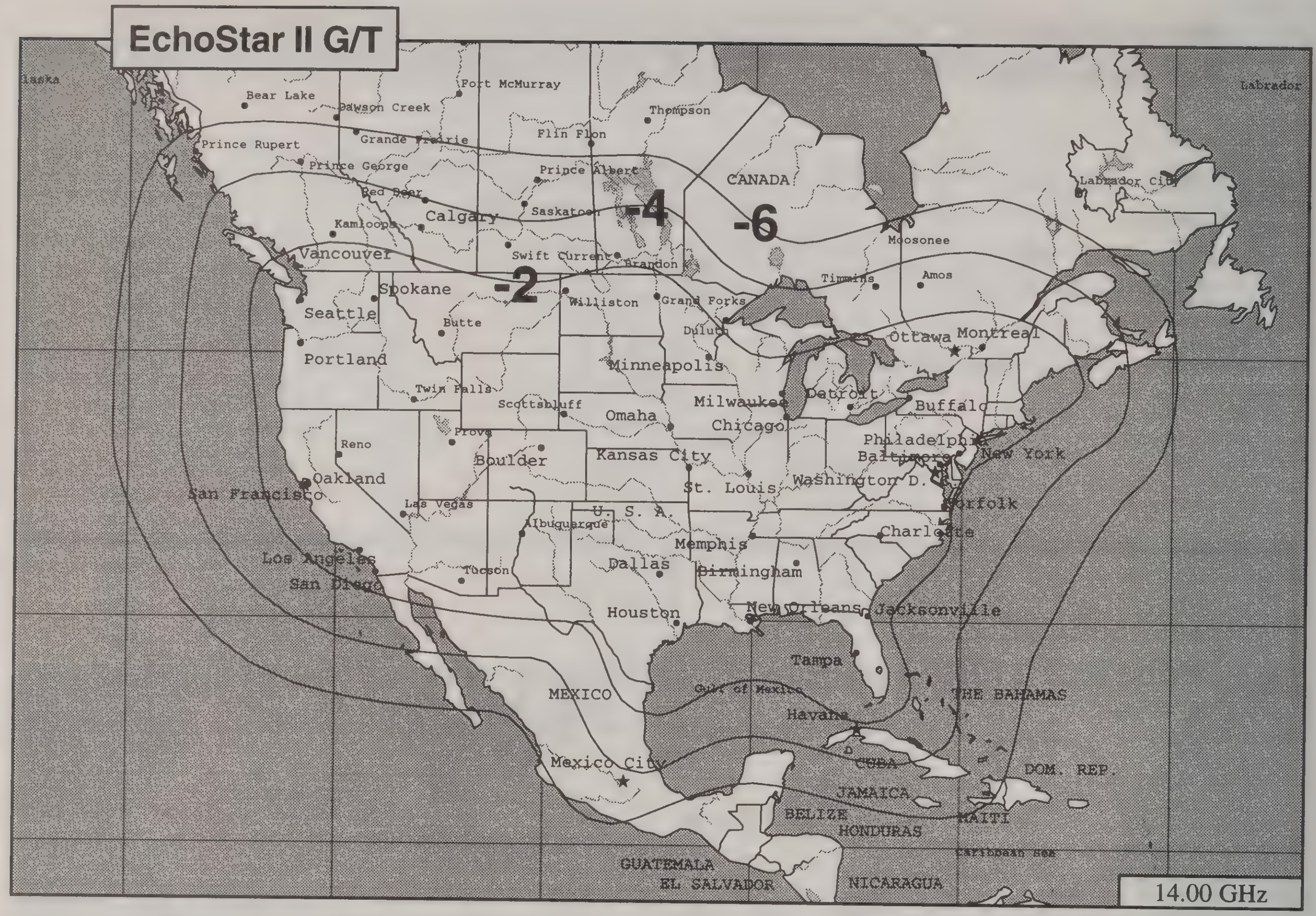
Orbital location:	241ºE (119°W)
Launch:	September 1996, Ariane 4
Expected lifetime:	15 years
Expected end of life:	2009

Antennas beam coverage overview:

Ku-band:	Conus

EchoStar II EIRP





EchoStar II G/T

GE AMERICAN COMMUNICATIONS
(GE AMERICOM)

4 Research Way
Princeton, NJ 08540
USA

Telephone:	(609)987-4000
Facsimile:	(609)987-4517
Web Site Address:	www.ge.com/capital/americom

Contacts:

George Monaster, Vice President, Cable Services
Andreas M. Georghiou, Vice President, Commercial Business Services

Overview:

Provides satellite distribution services for audio, video, voice, and data communications with its Satcom, GStar and Spacenet satellites. Supports agencies of the federal government with video, voice and wideband data services, and serves the business community with data and voice distribution.

Services Offered:

- Transponder lease and sale. Occasional-use and partial transponder capacity available
- Cable television and broadcast television distribution services including international program delivery and videoconferencing
- Digital audio transmission services (DATS) and SCPC radio service
- Data transmission services from 9.6 Kbps to 60 Mbps
- International uplinks/downlinks through Intelsat and PanAmSat

Satellite Control Network:

Satellite control: Vernon Valley, NJ; South Mountain, CA; McLean, VA

SATCOM C-BAND SYSTEM At A Glance

Satellite name:	Satcom C1, 223°E (137°W); Satcom C3, 229°E (131°W); Satcom C4, 225°E (135°W); Satcom C5, 221°E (139°W) [see Alascom/Aurora II]; Satcom 2R, 288°E (72°W); Satcom SN2, 291°E (69°W)
Spacecraft data:	
Mass (in orbit):	510 kg (C1); 620 kg (C3, C4); 747 kg (C5); 610 kg (2R); 689 kg (SN2)
Primary power (EOL):	1,040 W (C1); 1,400 W (C3, C4); 1,330 W (C5); 1,035 (2R)
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	November 20, 1990 (C1); July 10, 1992 (C3); August 1992 (C4); May 29, 1991 (C5); September 1983 (2R); November 1984 (SN2)
Launch vehicle:	Ariane
Expected lifetime:	10 years (C1, C5), 12 years (C3, C4, 2R, SN2)
Transponders:	
Power output:	8.5 W SSPA (C1, 2R), 16 W TWTA (C3, C4)
Polarization:	Linear
Redundancy:	7:6 (C1, 2R, SN2), 8:6 (C3, C4, C5)
Single carrier saturation flux density:	-83 dBW/sq.m., 2 dB/K (Conus); -84 dBW/sq.m., 1 dB/K (Alaska); -32 dBW/sq.m., -8 dB/K (Hawaii); -85 dBW/sq.m., 0 dB/K (Satcom 2R); -83 dBW/sq.m., 0 dB/K (Alaska); -76 dBW/sq.m., -8 dB/K (Hawaii)
Manufacturer:	GE Astrospace

Satcom C1Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	36	36	5.945	3.720
2	V	36	36	5.965	3.740
3	H	36	36	5.985	3.760
4	V	36	36	6.005	3.780
5	H	36	36	6.025	3.800
6	V	36	36	6.045	3.820
7	H	36	36	6.065	3.840
8	V	36	36	6.085	3.860
9	H	36	36	6.105	3.880
10	V	36	36	6.125	3.900
11	H	36	36	6.145	3.920
12	V	36	36	6.165	3.940
13	H	36	36	6.185	3.960
14	V	36	36	6.205	3.980
15	H	36	36	6.225	4.000
16	V	36	36	6.245	4.020
17	H	36	36	6.265	4.040
18	V	36	36	6.285	4.060
19	H	36	36	6.305	4.080
20	V	36	36	6.325	4.100
21	H	36	36	6.345	4.120
22	V	36	36	6.365	4.140
23	H	36	36	6.385	4.160
24	V	36	36	6.405	4.180

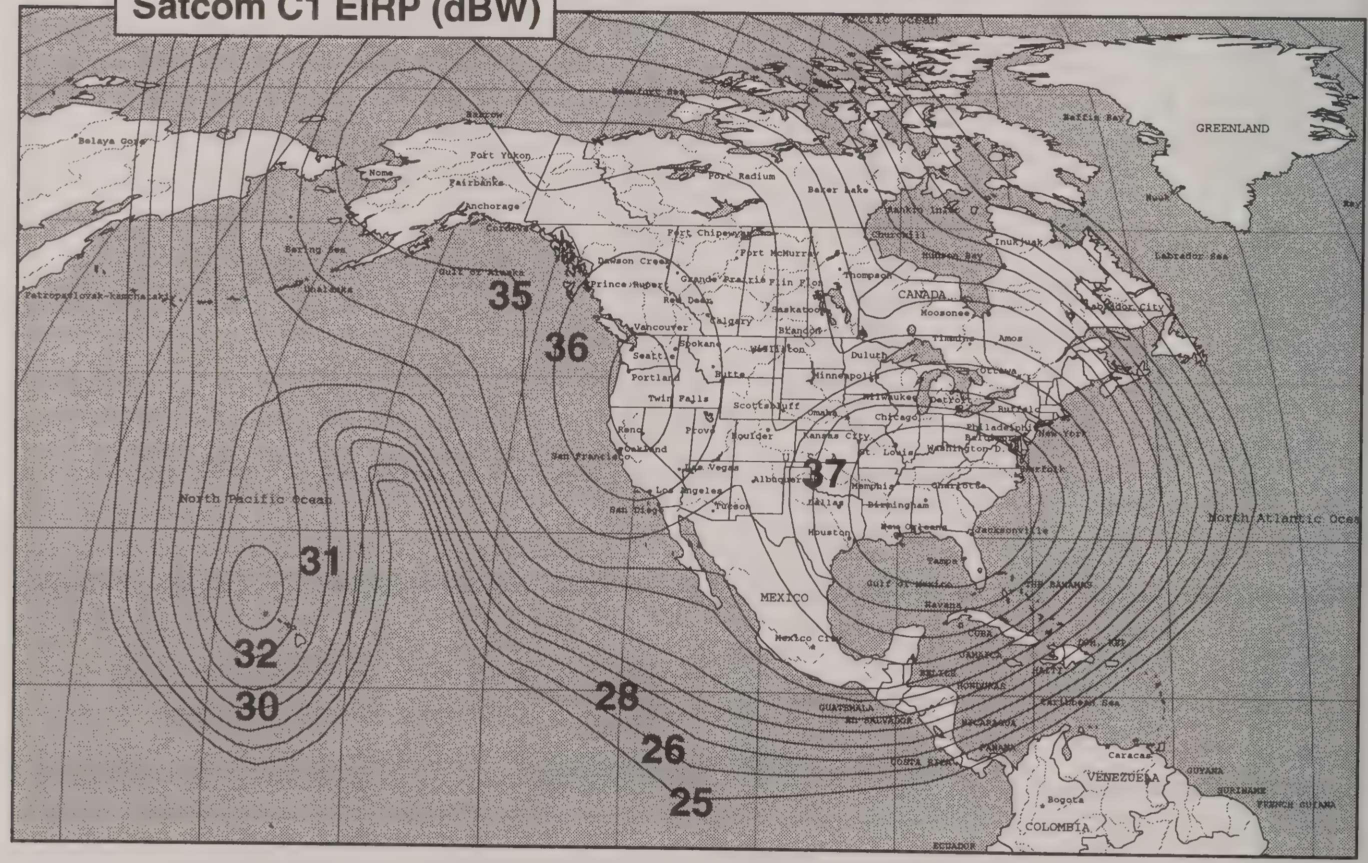
Satcom C1

Orbital position:	223°E (137°W)
Launch:	November 20, 1990, Delta
Expected lifetime:	10 years
Expected end of life:	2000

Antennas beam coverage overview:

C-band: USA 50 states

Satcom C1 EIRP (dBW)



Satcom C3, C4 and C5 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	36	40	5.945	3.720
2	H	36	40	5.965	3.740
3	V	36	40	5.985	3.760
4	H	36	40	6.005	3.780
5	V	36	40	6.025	3.800
6	H	36	40	6.045	3.820
7	V	36	40	6.065	3.840
8	H	36	40	6.085	3.860
9	V	36	40	6.105	3.880
10	H	36	40	6.125	3.900
11	V	36	40	6.145	3.920
12	H	36	40	6.165	3.940
13	V	36	40	6.185	3.960
14	H	36	40	6.205	3.980
15	V	36	40	6.225	4.000
16	H	36	40	6.245	4.020
17	V	36	40	6.265	4.040
18	H	36	40	6.285	4.060
19	V	36	40	6.305	4.080
20	H	36	40	6.325	4.100
21	V	36	40	6.345	4.120
22	H	36	40	6.365	4.140
23	V	36	40	6.385	4.160
24	H	36	40	6.405	4.180

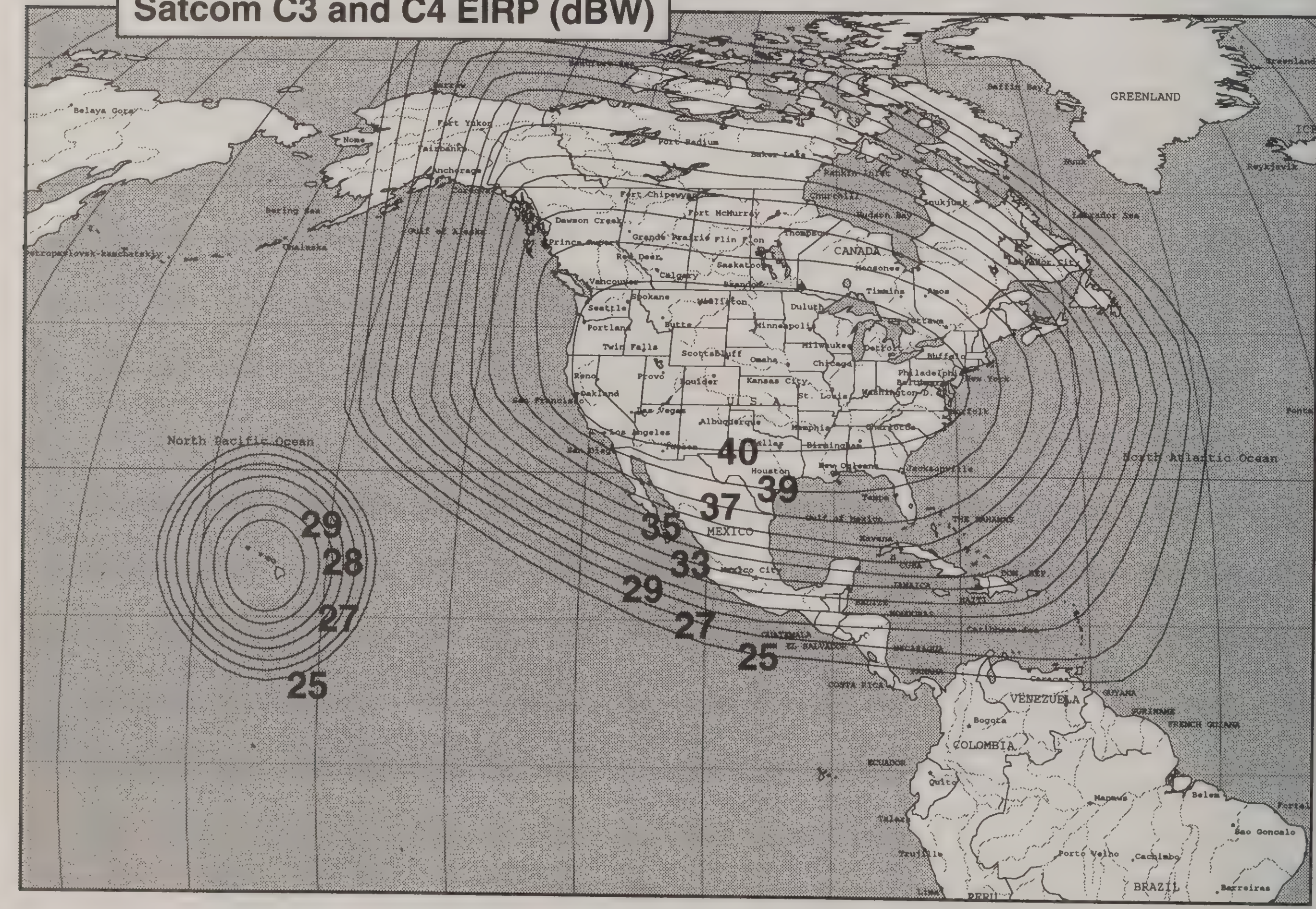
Satcom C3 , C4 and C5

Orbital location:	229°E (131°W) [C3], 225°E (135°W) [C4], 221°E (139°W) [C5]
Launch:	July 10, 1992, Ariane (C3); August 1992, Ariane (C4); May 29, 1991, Delta II (C5)
Expected lifetime:	12 years (C3, C4), 10 years (C5)
Expected end of life:	2004 (C3, C4), 2003 (C5)

Antennas beam coverage overview:

C-band: USA 50 states

Satcom C3 and C4 EIRP (dBW)



For information on footprints of Satcom C5 (Aurora II), see Alascom's profile.

Satcom 2R Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	36	39	5.945	3.720
2	H	36	39	5.965	3.740
3	V	36	39	5.985	3.760
4	H	36	39	6.005	3.780
5	V	36	39	6.025	3.800
6	H	36	39	6.045	3.820
7	V	36	39	6.065	3.840
8	H	36	39	6.085	3.860
9	V	36	39	6.105	3.880
10	H	36	39	6.125	3.900
11	V	36	39	6.145	3.920
12	H	36	39	6.165	3.940
13	V	36	39	6.185	3.960
14	H	36	39	6.205	3.980
15	V	36	39	6.225	4.000
16	H	36	39	6.245	4.020
17	V	36	39	6.265	4.040
18	H	36	39	6.285	4.060
19	V	36	39	6.305	4.080
20	H	36	39	6.325	4.100
21	V	36	39	6.345	4.120
22	H	36	39	6.365	4.140
23	V	36	39	6.385	4.160
24	H	36	39	6.405	4.180

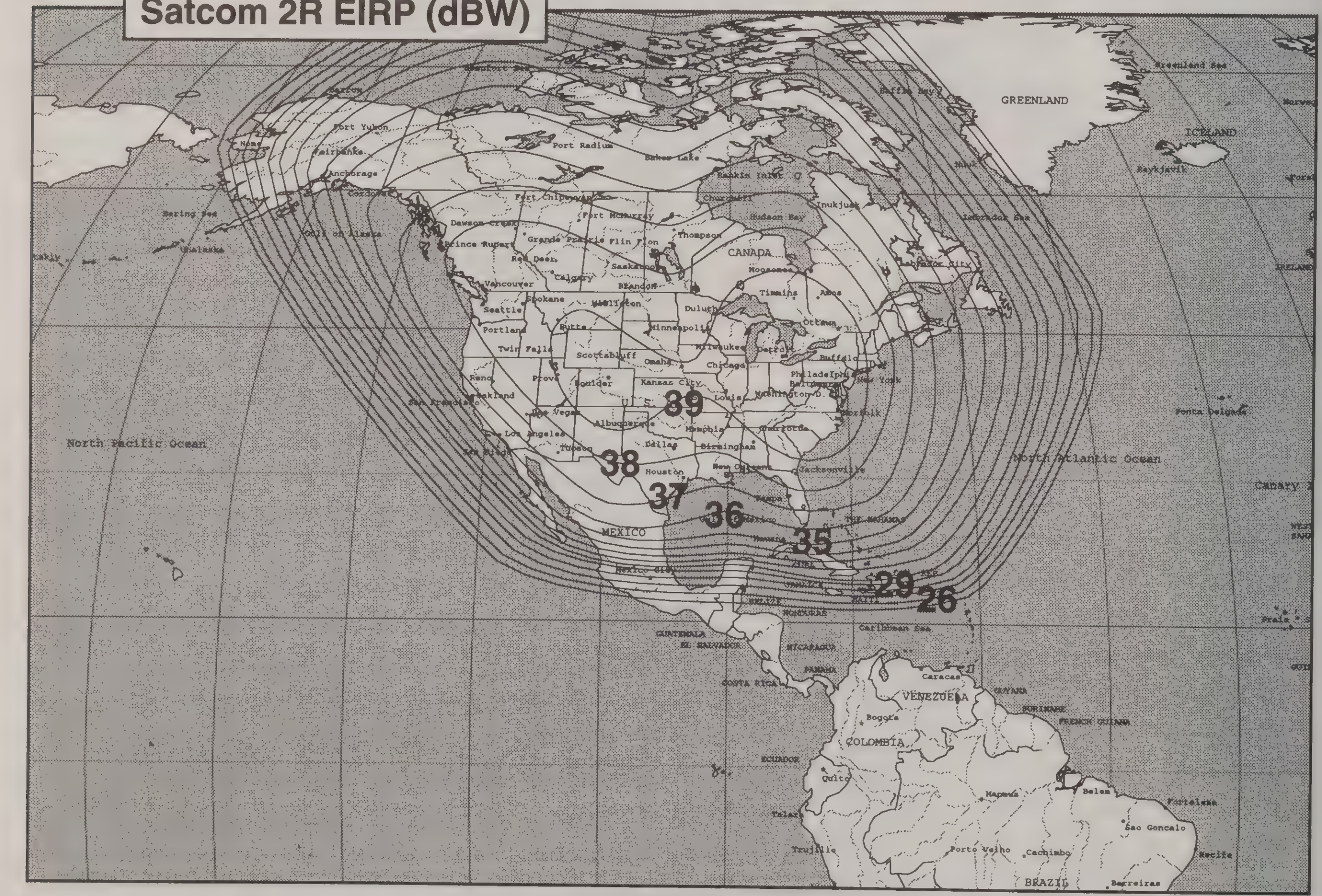
Satcom 2R

Orbital location:	288°E (72°W)
Launch:	September 1983, Delta 394
Expected lifetime:	12 years (exceeded)
Expected end of life:	1995 (still operational)

Antennas beam coverage overview:

C-band:	USA 50 states

Satcom 2R EIRP (dBW)



Satcom SN2 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	36	35*	5.945	3.720
2	H	36	35*	5.985	3.760
3	H	36	35*	6.025	3.800
4	H	36	35*	6.065	3.840
5	H	36	35*	6.105	3.880
6	H	36	35*	6.145	3.920
7	H	36	35*	6.185	3.960
8	H	36	35*	6.225	4.000
9	H	36	35*	6.265	4.040
10	H	36	35*	6.305	4.080
11	H	36	35*	6.345	4.120
12	H	36	35*	6.385	4.160
13	V	72	35-37**	5.985	3.760
14	V	72	35-37**	6.065	3.840
15	V	72	35-37**	6.145	3.920
16	V	72	35-37**	6.225	4.000
17	V	72	35-37**	6.305	4.080
18	V	72	35-37**	6.385	4.160
19	H	72	44	14.040	11.740
20	H	72	44	14.120	11.820
21	H	72	44	14.200	11.900
22	H	72	44	14.280	11.980
23	H	72	44	14.360	12.060
24	H	72	44	14.440	12.140

* Conus; Caribbean/Central America: 26-33 dBW

** Conus; Caribbean/Central America: 28-35 dBW

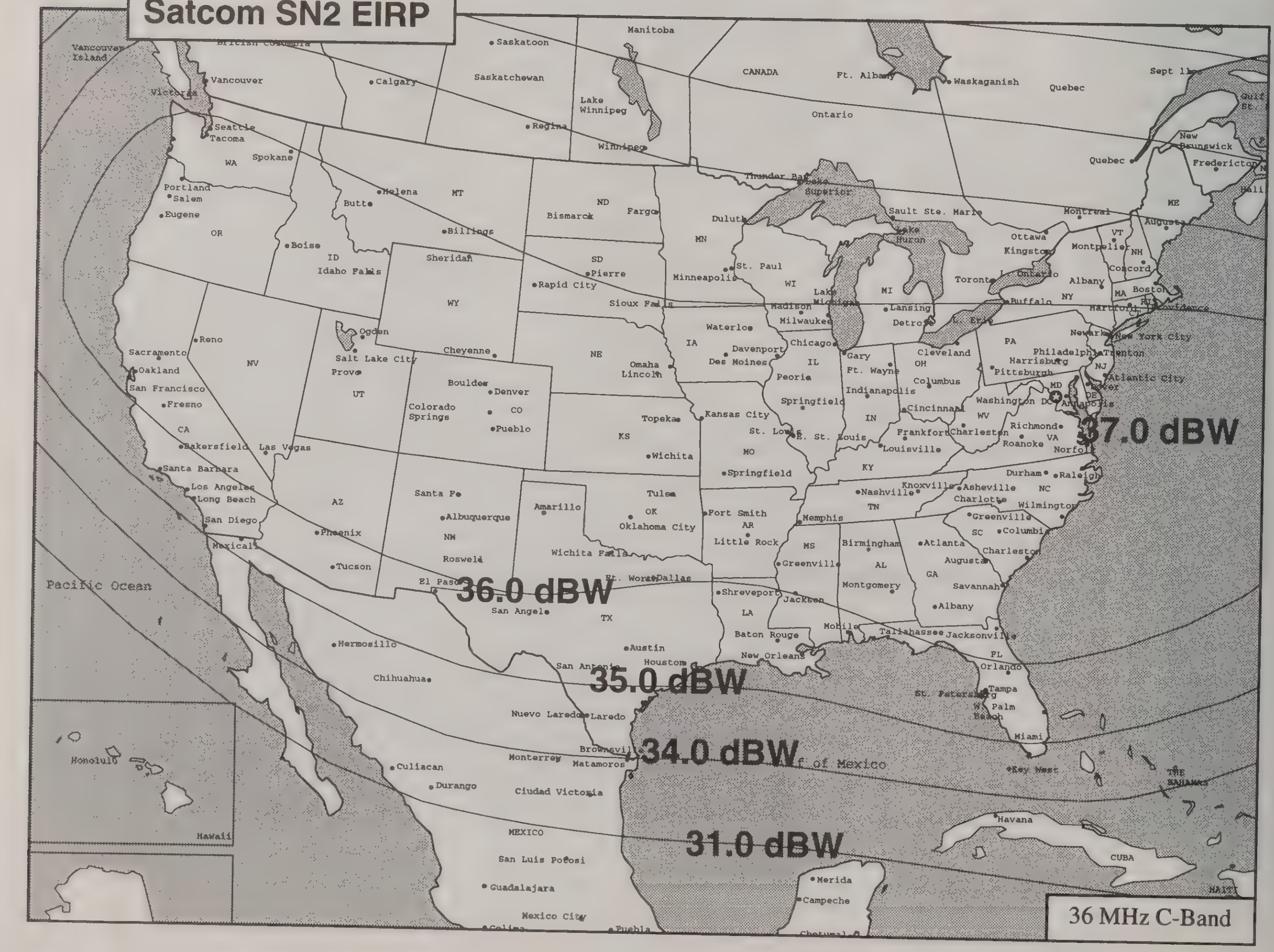
Satcom SN2

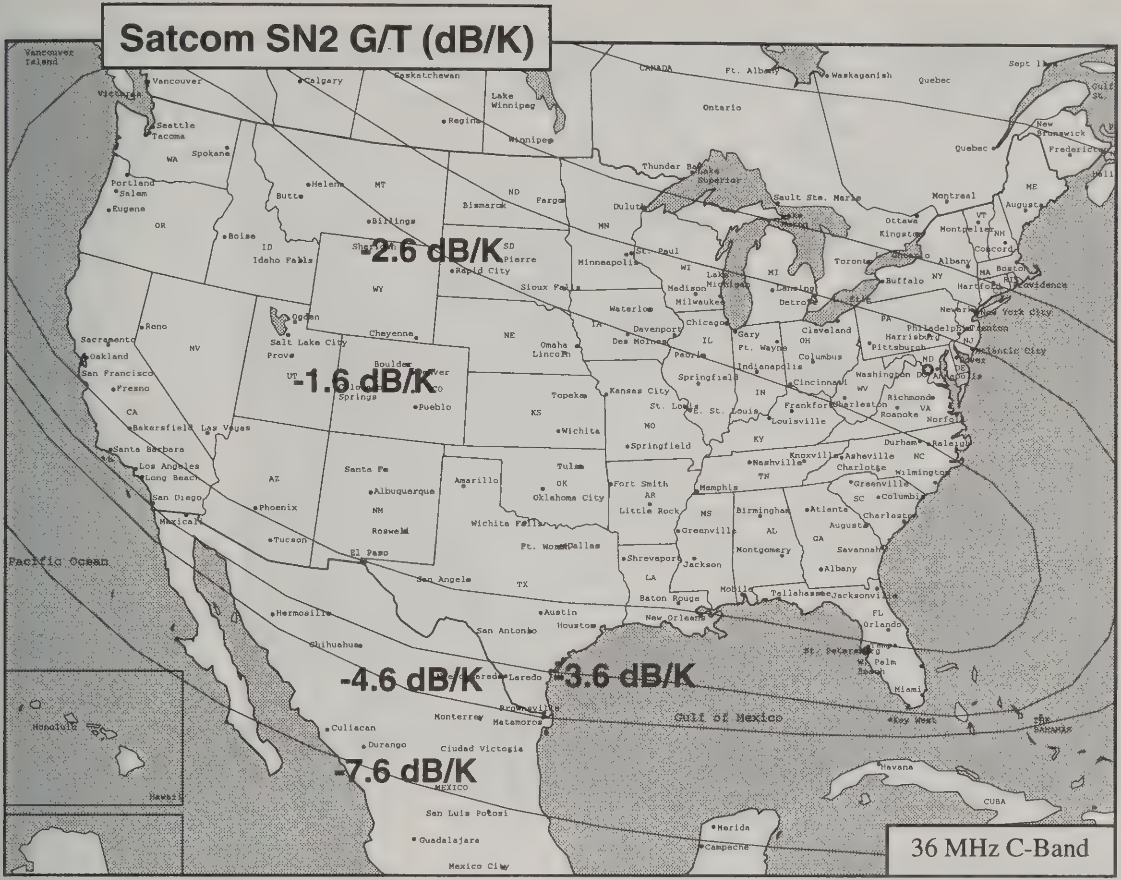
Orbital location:	291°E (69°W)
Launch:	November 1984
Expected lifetime:	12 years
Expected end of life:	1996

Antennas beam coverage overview:

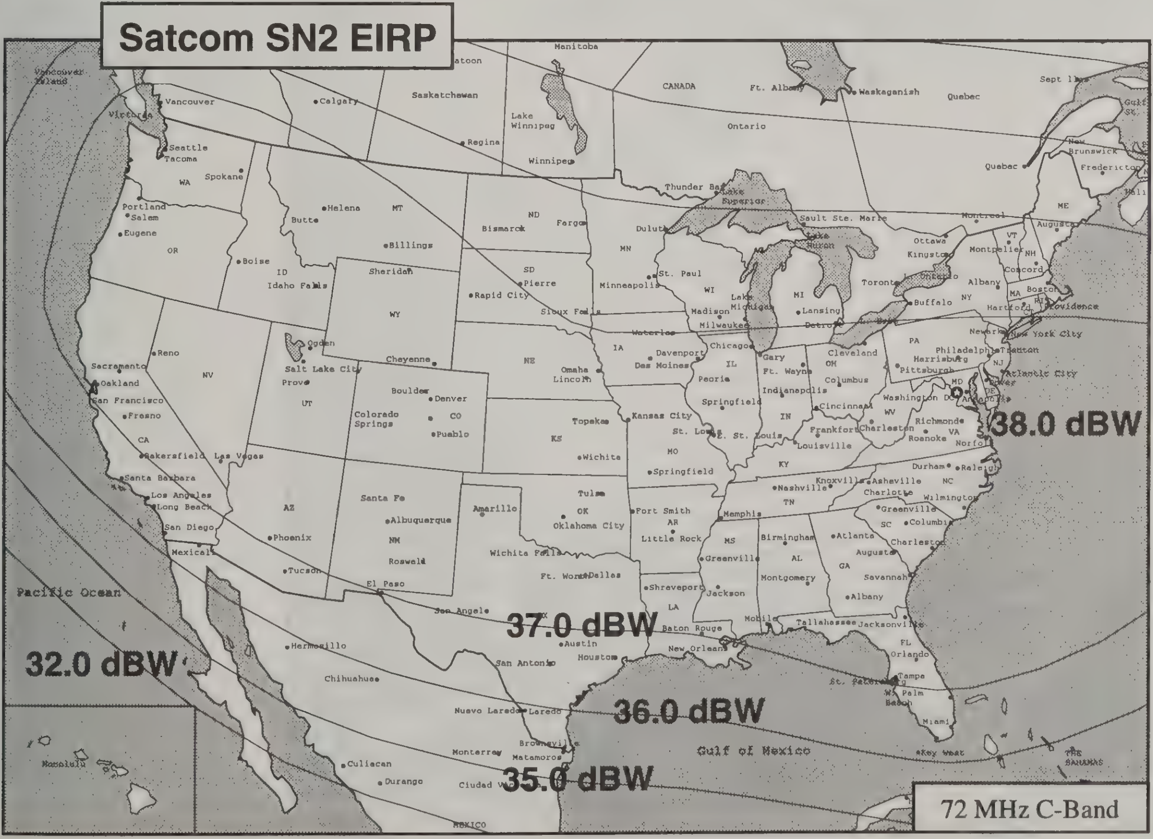
C-band:	USA 50 states
Ku-band:	USA 50 states

Satcom SN2 EIRP

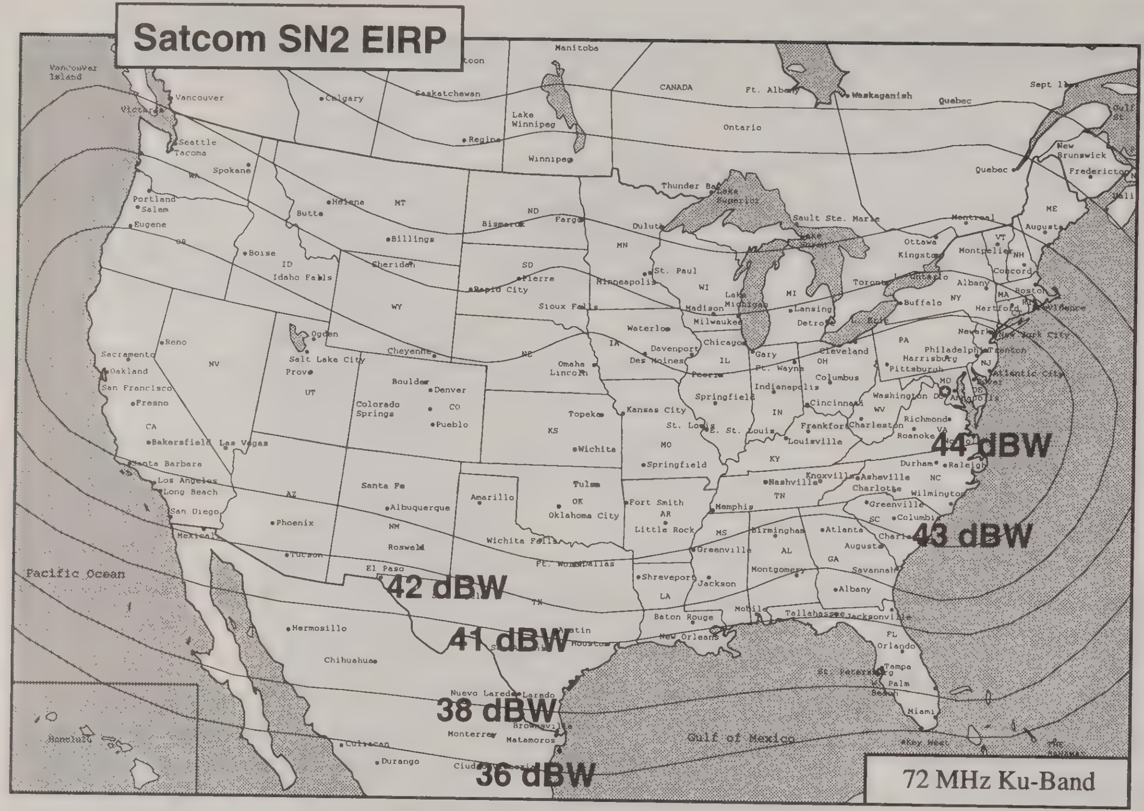


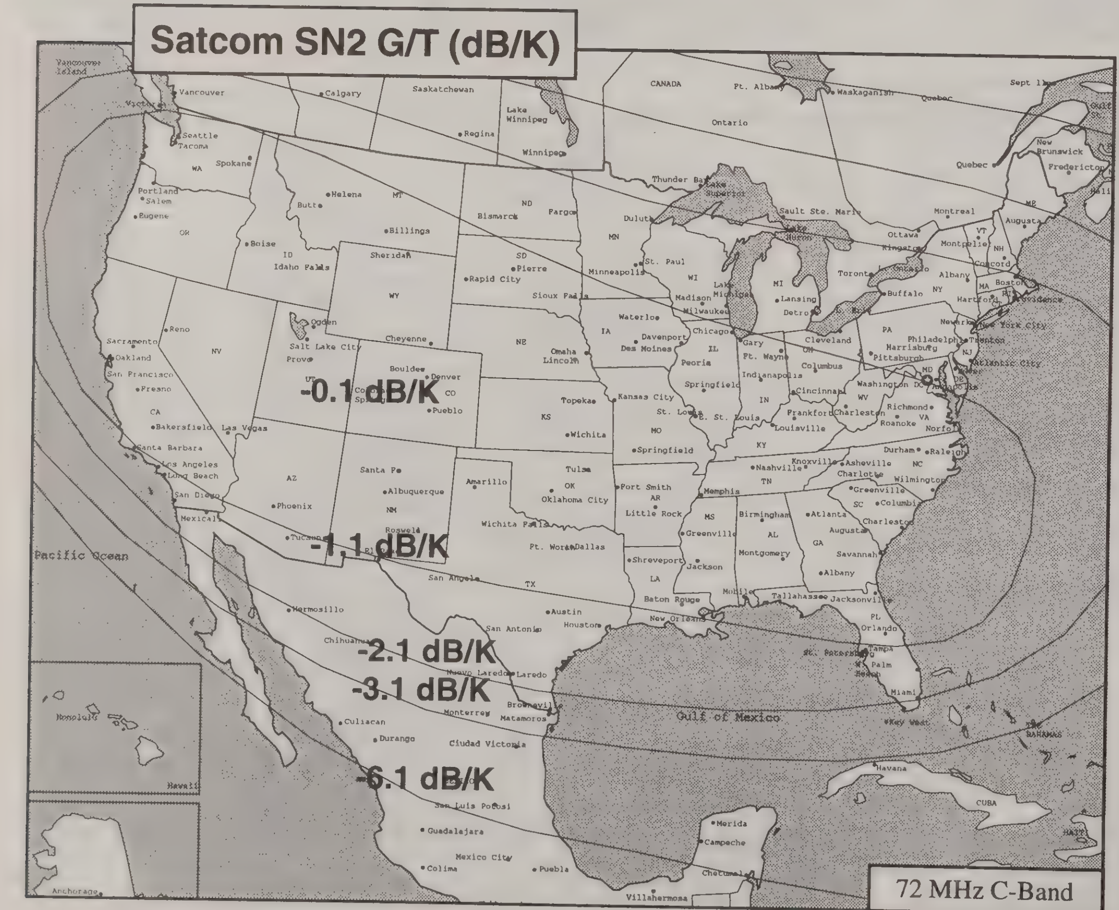


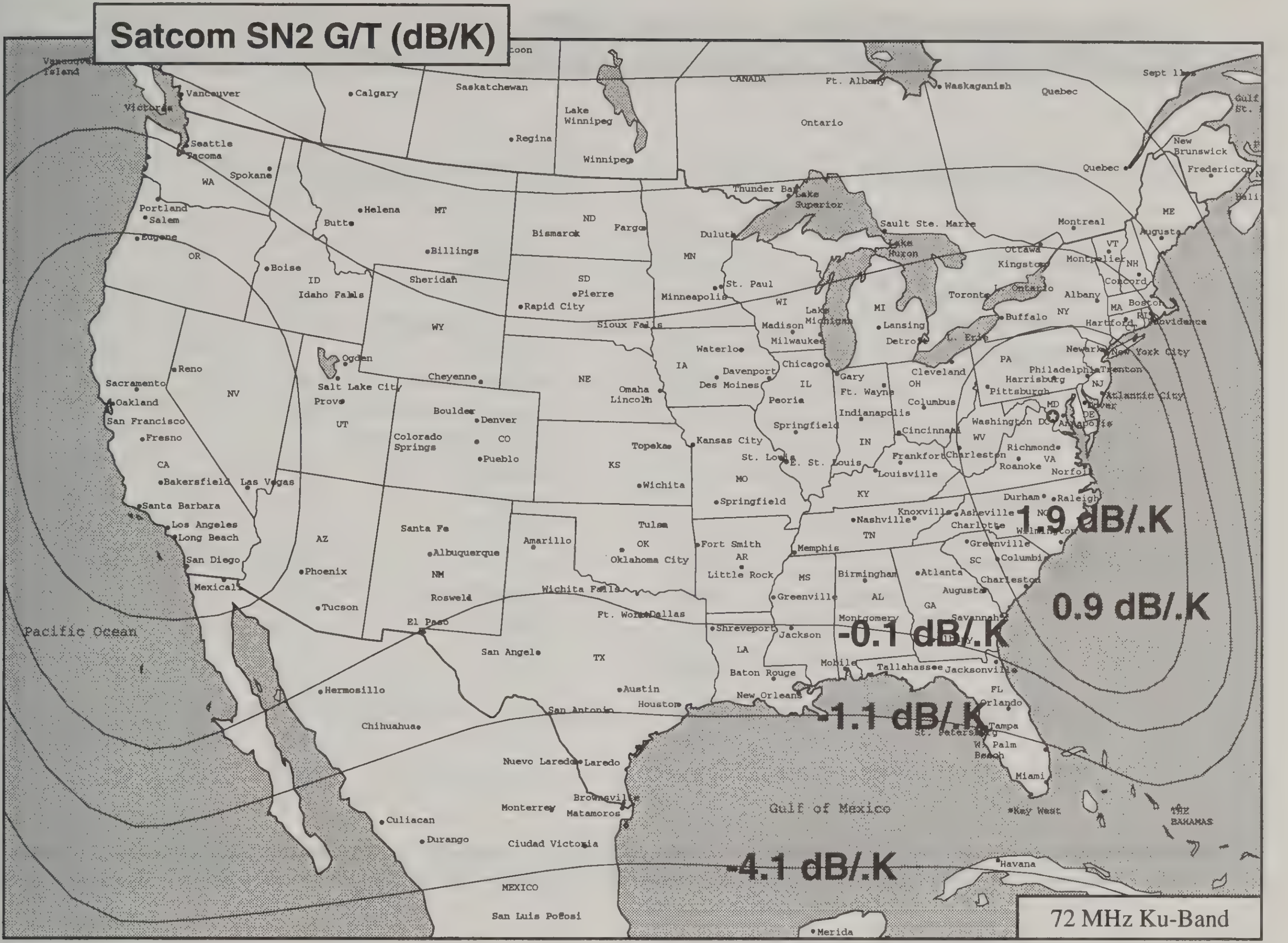
Satcom SN2 G/T (dB/K)



Satcom SN2 EIRP


Satcom SN2 EIRP
44 dBW
43 dBW
42 dBW
41 dBW
38 dBW
36 dBW
Pacific Ocean
Gulf of Mexico
72 MHz Ku-Band


Satcom SN2 G/T (dB/K)
-0.1 dB/K
-1.1 dB/K
-2.1 dB/K
-3.1 dB/K
-6.1 dB/K
Pacific Ocean
Gulf of Mexico
72 MHz C-Band



Satcom SN2 G/T (dB/K)

SATCOM KU-BAND SYSTEM At A Glance

Satellite name:	Satcom K1, 275°E (85°W); Satcom K2, 279°E (81°W)
Spacecraft data:	
Mass (in orbit):	780 kg
Primary power (EOL):	2,490 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	November 26, 1985 (K1), January 12, 1986 (K2)
Launch vehicle:	Columbia 176 (K1), Atlantis 191 (K2)
Expected lifetime:	10 years
Transponders:	
Power output:	47 W TWTA
Polarization:	Linear
Redundancy:	7:6
Single carrier saturation flux density:	-96 to -76 dBW/sq.m., 2 dB/K
Manufacturer:	GE Astrospace

Satcom K1 and K2 Transponder Frequency Plan

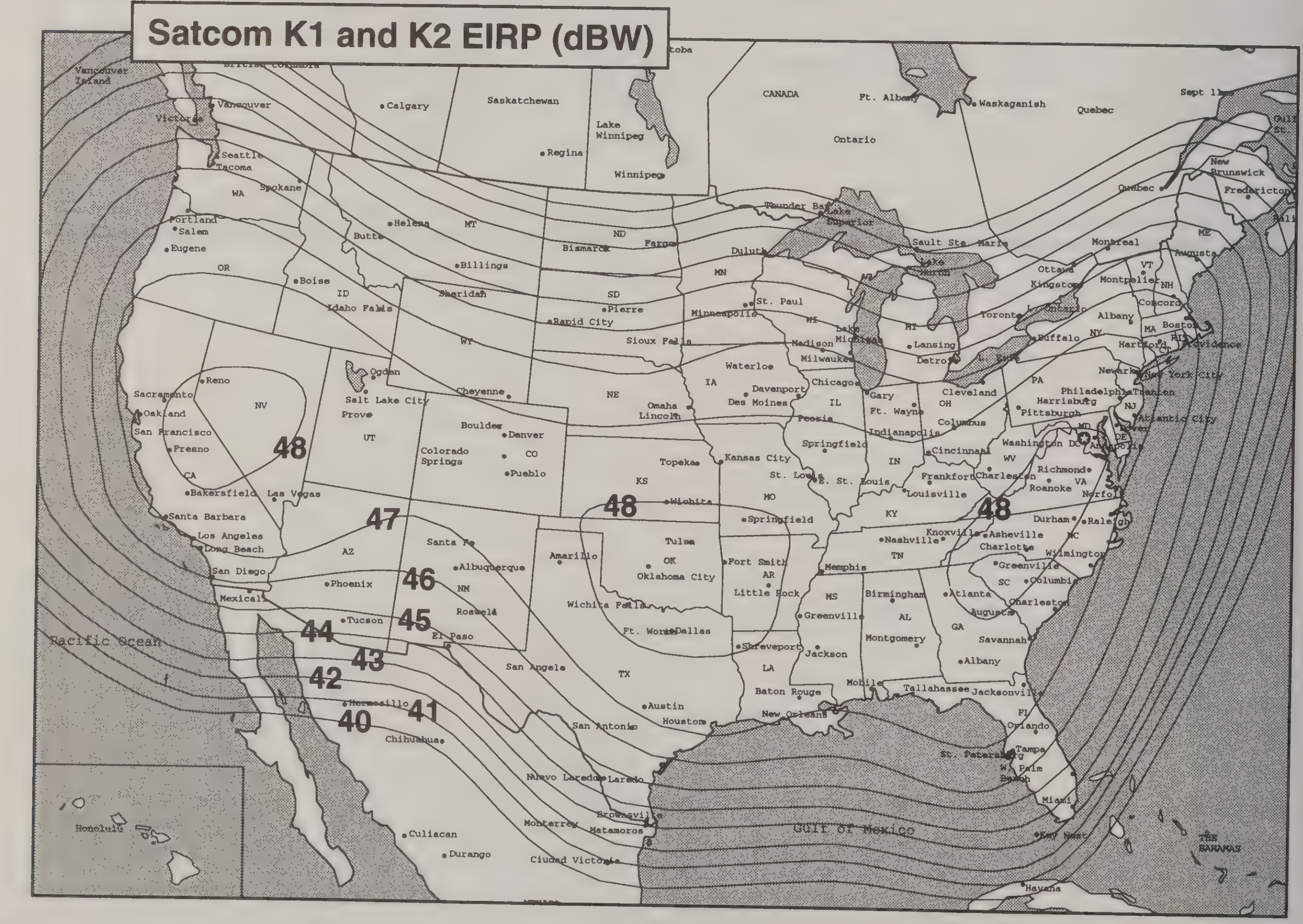
Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	54	44-53	14.030	11.730
2	V	54	44-53	14.044	11.744
3	H	54	44-53	14.091	11.791
4	V	54	44-53	14.105	11.805
5	H	54	44-53	14.152	11.852
6	V	54	44-53	14.166	11.866
7	H	54	44-53	14.213	11.913
8	V	54	44-53	14.227	11.927
9	H	54	44-53	14.274	11.974
10	V	54	44-53	14.288	11.988
11	H	54	44-53	14.335	12.035
12	V	54	44-53	14.349	12.049
13	H	54	44-53	14.396	12.096
14	V	54	44-53	14.410	12.110
15	H	54	44-53	14.457	12.157
16	V	54	44-53	14.471	12.171

Satcom K1 and K2

Orbital location:	275°E (85°W) [K1], 279°E (81°W) [K2]
Launch:	November 26, 1985, STS (K1); January 12, 1986, STS (K2)
Expected lifetime:	10 years
Expected end of life:	1995, still operational (K1), 1996 (K2)

Antennas beam coverage overview:

Ku-band:	USA 50 states


Satcom K1 and K2 EIRP (dBW)

GSTAR SYSTEM At A Glance

Satellite name:	GStar I, 257°E (103°W); GStar II, 235°E (125°W); GStar III, 273°E (87°W); GStar IV, 255°E (105°W)
Spacecraft data:	
Mass (in orbit):	715 kg
Primary power (EOL):	1,900 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	May 8, 1985 (GStar I); March 28, 1986 (GStar II); September 8, 1988 (Gstar III); November 20, 1990 (GStar IV)
Launch vehicle:	Ariane 3 (I, II, III); Ariane 4 (IV)
Expected lifetime:	10 years
Transponders:	
Number:	16
Power output:	14 channels with 20 W TWTA, 2 channels with 27 W TWTA
Polarization:	Linear
Redundancy:	4:2
Single carrier saturation flux density:	-93.1 to -72.1 dBW/sq.m.
Manufacturer:	GE Astrospace

GStar I, II & IV Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	54	38.5-44**	14.030	11.738
2	H	54	38.5-44*	14.091	11.791
3	H	54	38.5-44**	14.152	11.852
4	H	54	38.5-44*	14.213	11.913
5	H	54	38.5-44*	14.274	11.974
6	H	54	38.5-44*	14.335	12.036
7	H	54	38.5-44*	14.396	12.096
8	H	54	38.5-44*	14.457	12.157
9	V	54	38.5-44*	14.044	11.744
10	V	54	38.5-44*	14.105	11.805
11	V	54	38.5-44*	14.166	11.866
12	V	54	38.5-44*	14.227	11.927
13	V	54	38.5-44*	14.288	11.988
14	V	54	38.5-44*	14.349	12.049
15	V	54	38.5-44*	14.410	12.110
16	V	54	38.5-44*	14.471	12.171

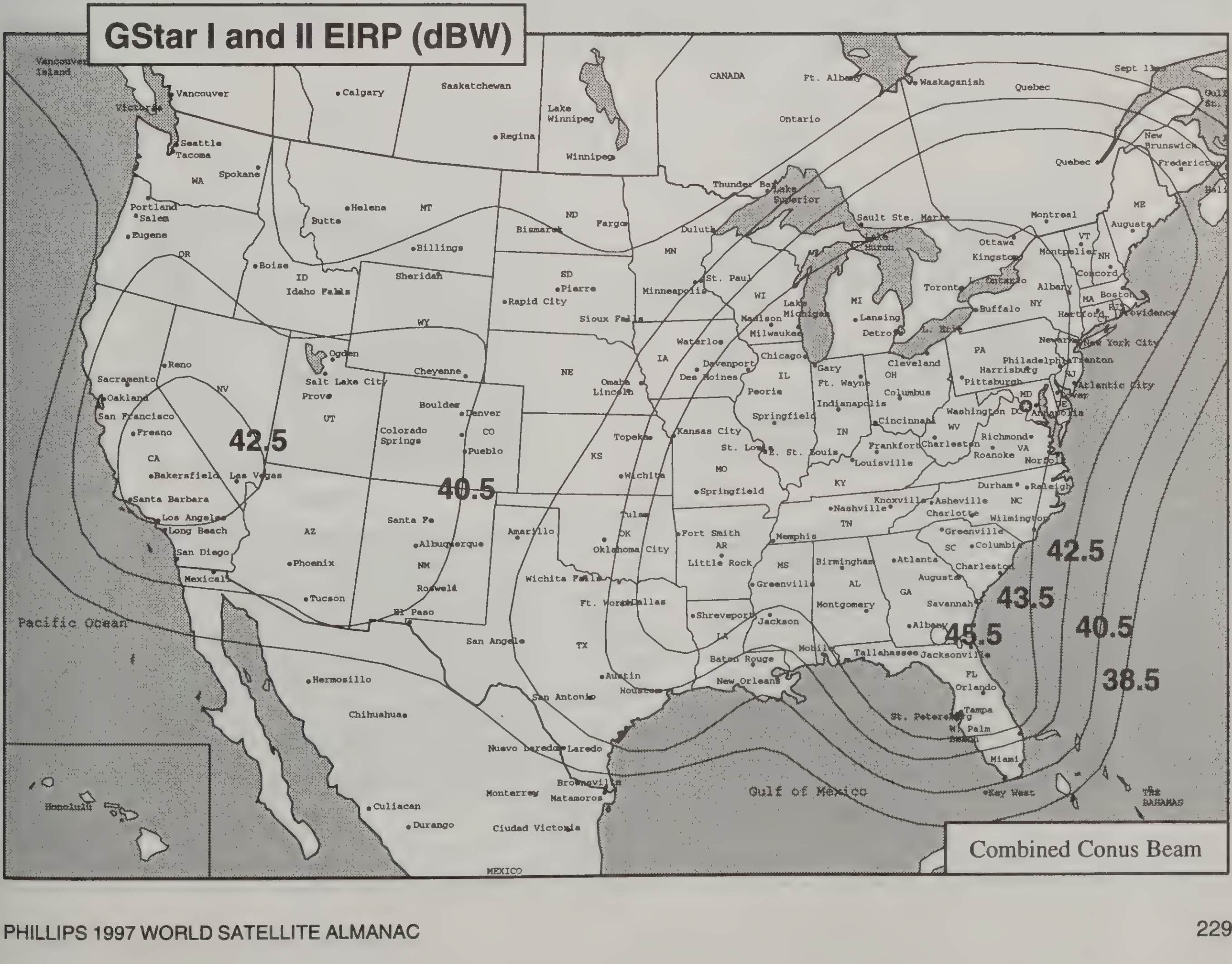
* Conus; 1/2 Conus: 39-46 dBW; Spot beams: 47-50 dBW
** Conus; Alaska and Hawaii: 39-41 dBW

GStar I, II, III, IV

Orbital position:	257ºE (103°W) [I]; 235ºE (125°W) [II]; 273°E (87°W) [III]; 255ºE (105°W) [IV]
Launch:	May 8, 1985, Ariane 3 (I); March 28, 1986, Ariane (II); September 8, 1988, Ariane 3 (III); November 20, 1990, Ariane 4 (IV)
Expected lifetime:	10 years
Expected end of life:	1996 (I), 1996 (II), 1988 (III), 2003 (IV)

Antennas beam coverage overview:

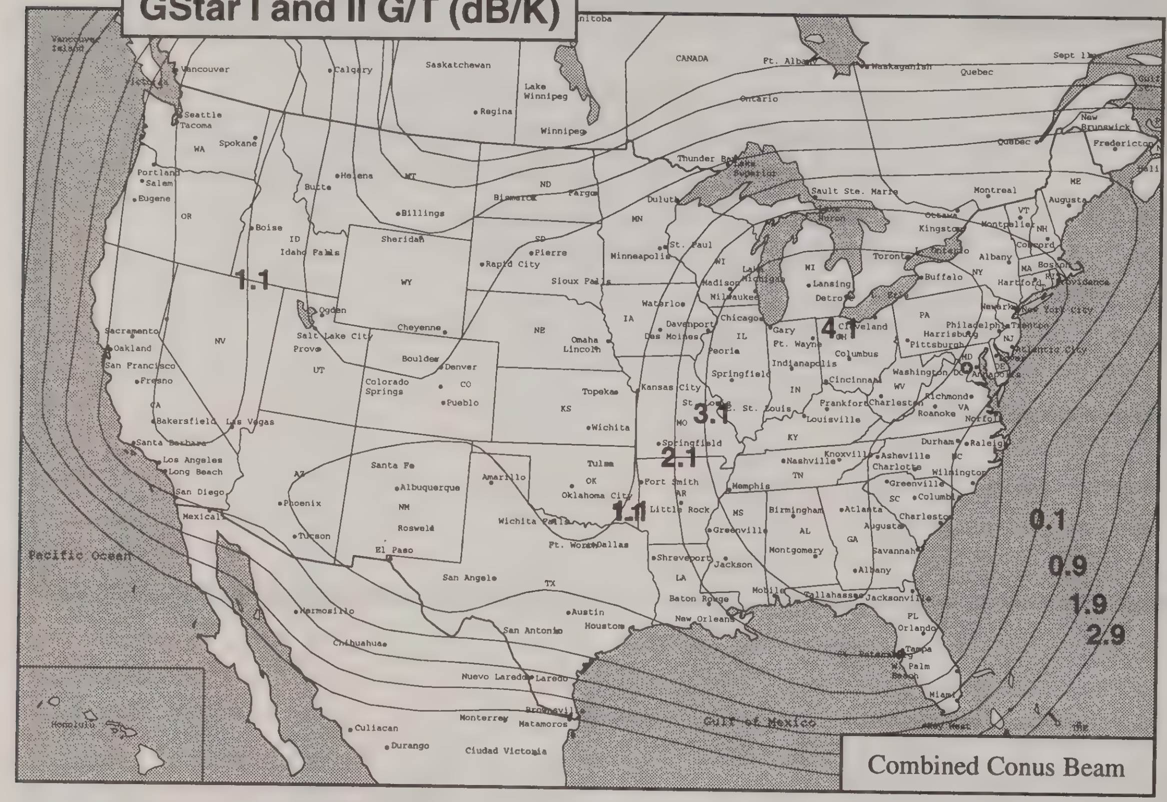
Ku-band:	USA 50 states



GStar I and II EIRP (dBW)

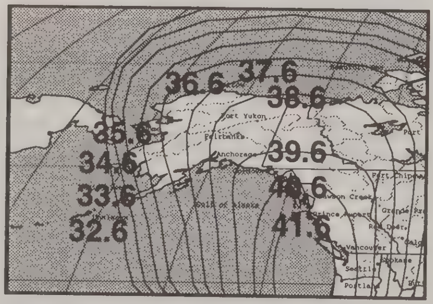
Combined Conus Beam

GStar I and II G/T (dB/K)



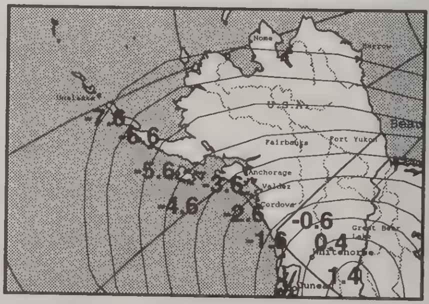
Combined Conus Beam

GStar I and II

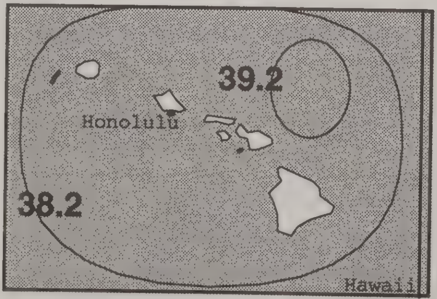


EIRP (dBW)

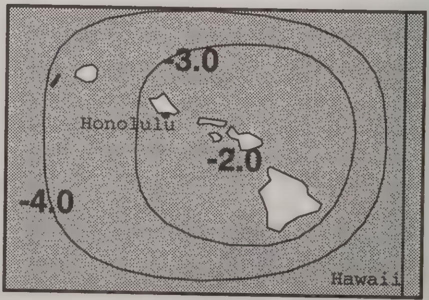
Combined Beam Alaska



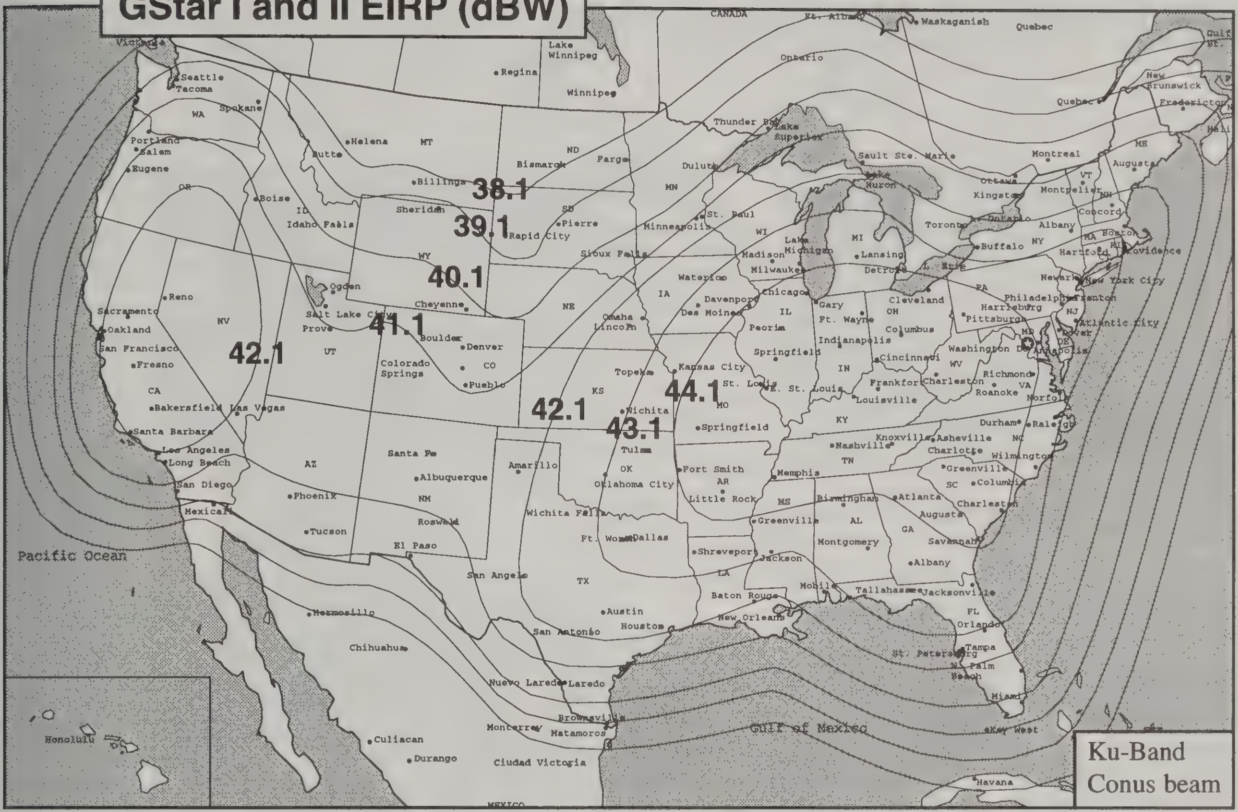
G/T (dB/K)



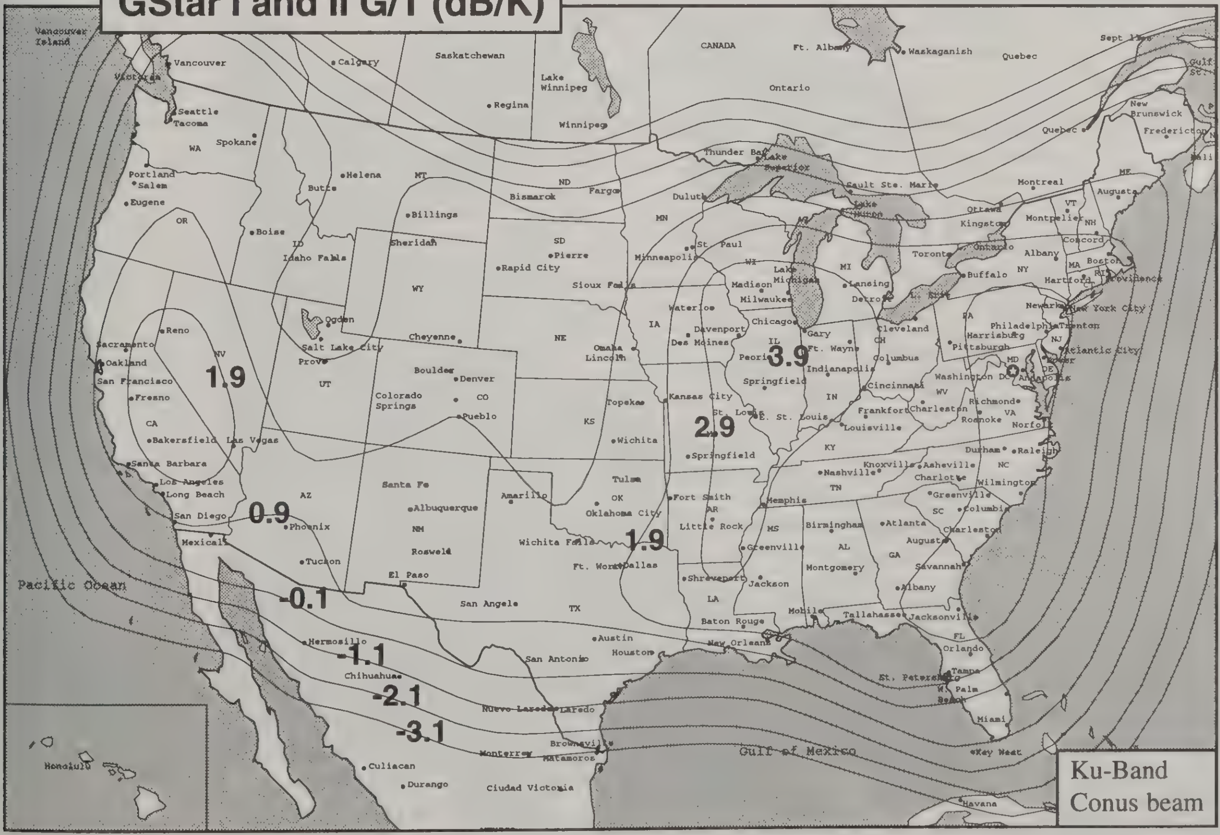
Combined Beam Hawaii

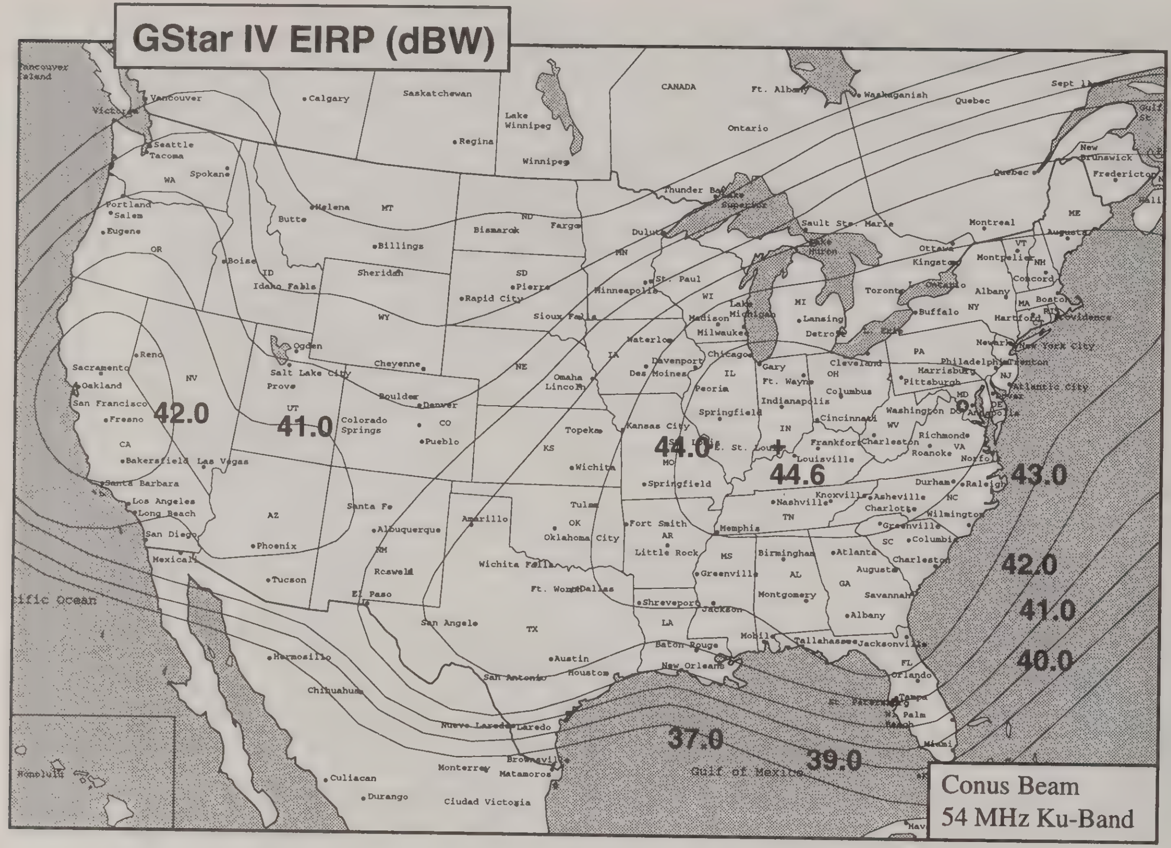


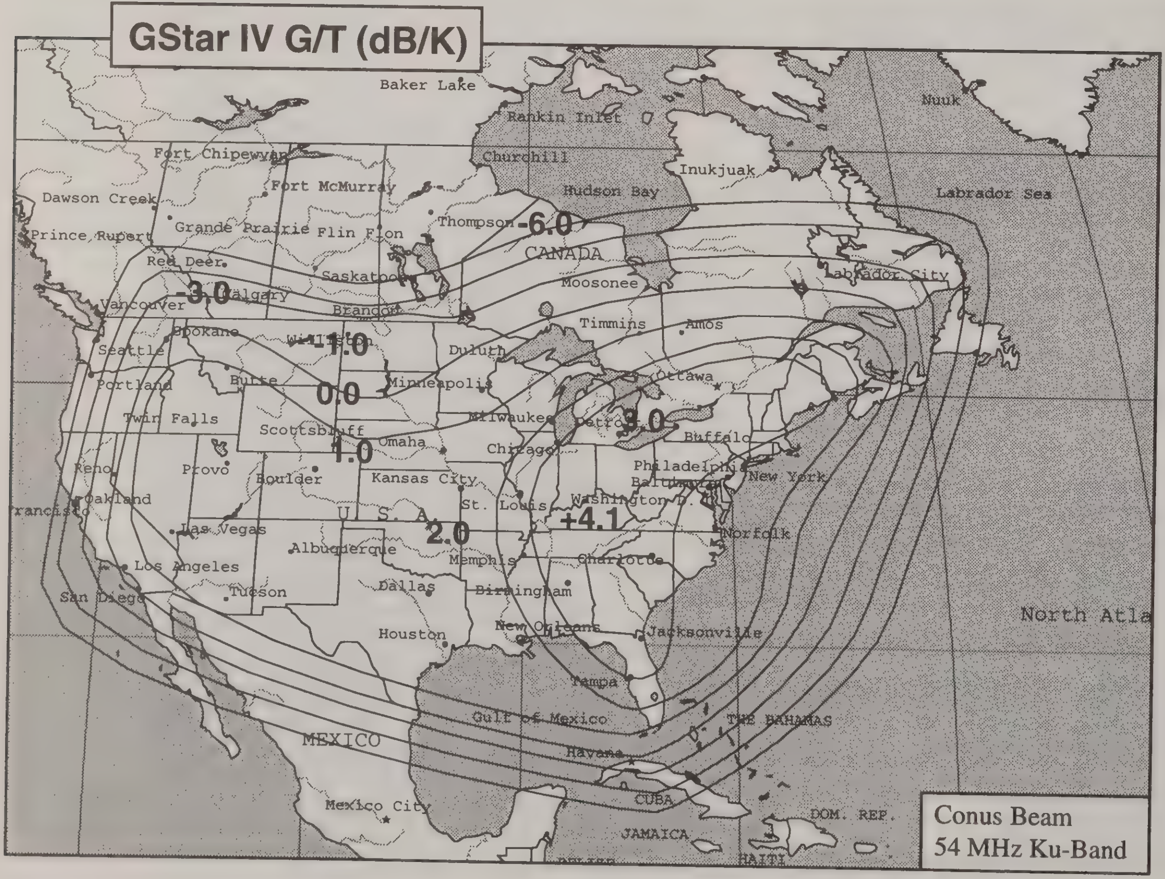
GStar I and II EIRP (dBW)



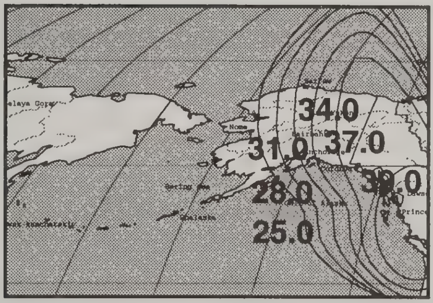
GStar I and II G/T (dB/K)

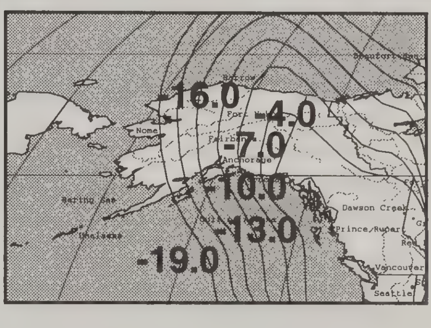



GStar IV EIRP (dBW)
42.0
41.0
44.0
44.6
43.0
42.0
41.0
40.0
37.0
39.0
Gulf of Mexico
Pacific Ocean
CANADA
Vancouver
Seattle
Portland
Sacramento
San Francisco
Los Angeles
San Diego
Salt Lake City
Denver
Phoenix
Albuquerque
El Paso
Kansas City
St. Louis
Chicago
Minneapolis
Dallas
Houston
San Antonio
New Orleans
Memphis
Atlanta
Miami
Washington DC
New York City
Boston
Montreal
Toronto
Conus Beam
54 MHz Ku-Band


GStar IV G/T (dB/K)
-6.0
-3.0
-1.0
0.0
1.0
2.0
3.0
+4.1
Baker Lake
Rankin Inlet
Churchill
Hudson Bay
Inukjuak
Nuuk
Labrador Sea
CANADA
U. S. A.
MEXICO
Mexico City
Gulf of Mexico
THE BAHAMAS
CUBA
Havana
JAMAICA
HAITI
DOM. REP.
North Atla
Conus Beam
54 MHz Ku-Band

GStar IV

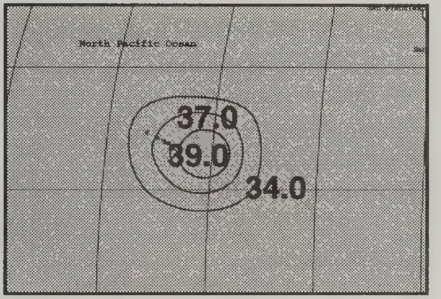


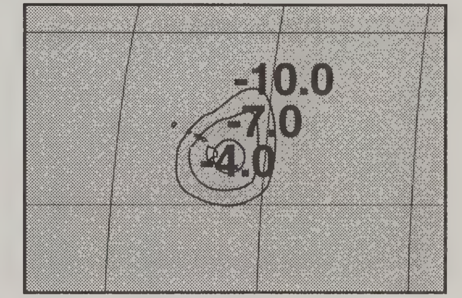


Combined
Beam
Alaska

EIRP (dBW)

G/T (dB/K)





Combined
Beam
Hawaii

SPACENET SYSTEM At A Glance

Satellite name: Spacenet III, 273°E (87°W); Spacenet IV, 259°E (101°W)

Spacecraft data:
- Mass (in orbit): 692 kg
- Primary power (EOL): 1,300 W
- Eclipse protection: All transponders
- Stabilization: 3-axis
- Launch date: March 11, 1988 (Spacenet III); April 1991 (Spacenet IV)
- Launch vehicle: Ariane 3 (III), Delta 2 (IV)
- Expected lifetime: 10 years

Transponders:
- Number: 24
- Power output: 12 8.5 W, 6 16 W TWTA (C-band); 6 16 W TWTA (Ku-band); 30 W TWTA (Spacenet IV)
- Polarization: Frequency re-used by horizontal and vertical polarization
- Redundancy: 4:2 (C-band), 2:1 (Ku-band)

Single carrier saturation flux density: -86 dBW/ sq.m.

Manufacturer: GE Astrospace

Spacenet III Transponder Frequency Plan

Tr.#	Pol.	BW (MHz)	EIRP (dBW)	Frequency
1[1]	H	36	36	3720.0
13L[2]	V	72	37	3740.0
2[3]	H	36	36	3760.0
13U[4]	V	72	37	3780.0
3[5]	H	36	36	3800.0
14L	V	72	39	3820.0
14U	V	72	37	3860.0
5[9]	H	36	36	3880.0
6[11]	H	36	36	3920.0
7[13]	H	36	36	3960.0
16L[14]	V	72	37	3980.0
8[15]	H	36	36	4000.0
16U[16]	V	72	37	4020.0
9[17]	H	36	36	4040.0
17L[18]	V	72	37	4060.0
10[19]	H	36	36	4080.0
17U	V	72	37	4100.0
11[21]	H	36	36	4120.0
18L	V	72	37	4140.0
12[23]	H	36	36	4160.0
18U	V	72	37	4180.0
21	H	72	49	11900.0
22	H	72	47	11980.0
23	H	72	49	12060.0
24	H	72	47	12140.0

Spacenet IV Transponder Frequency Plan

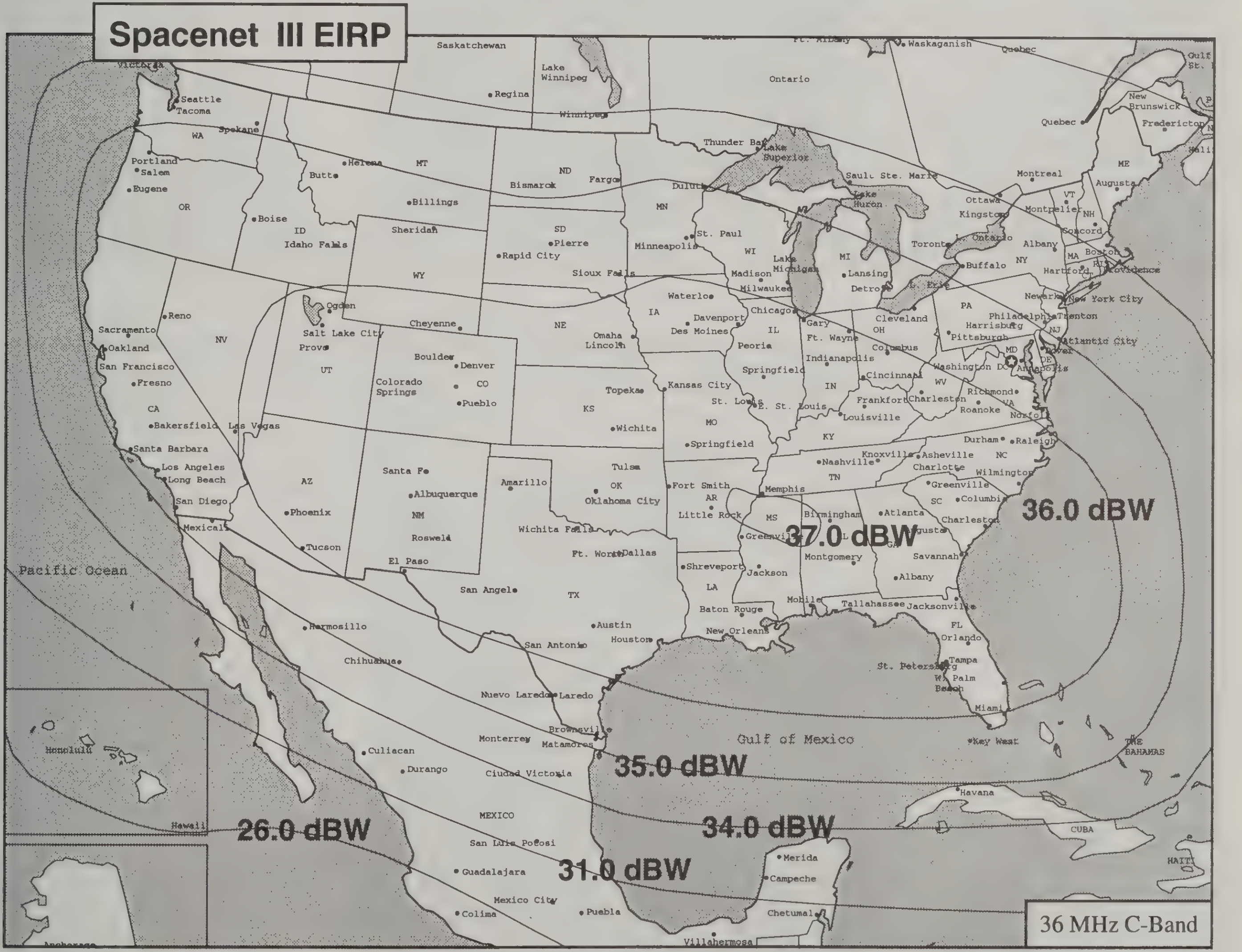
Tr.#	Pol.	BW (MHz)	EIRP (dBW)	Frequency
8[4]	H	36	37	3780.0
3[5]	V	36	37	3800.0
9[6]	H	36	37	3820.0
10[8]	H	36	37	3860.0
5[9]	V	36	37	3880.0
11[10]	H	36	37	3900.0
6[11]	V	36	37	3920.0
12[12]	H	36	37	3940.0
13U[15]	V	72	37	4000.0
17L[18]	H	72	37	4060.0
18L[22]	H	72	37	4140.0
23	H	72	42	12060.0
24	H	72	42	12140.0

Spacenet III, IV

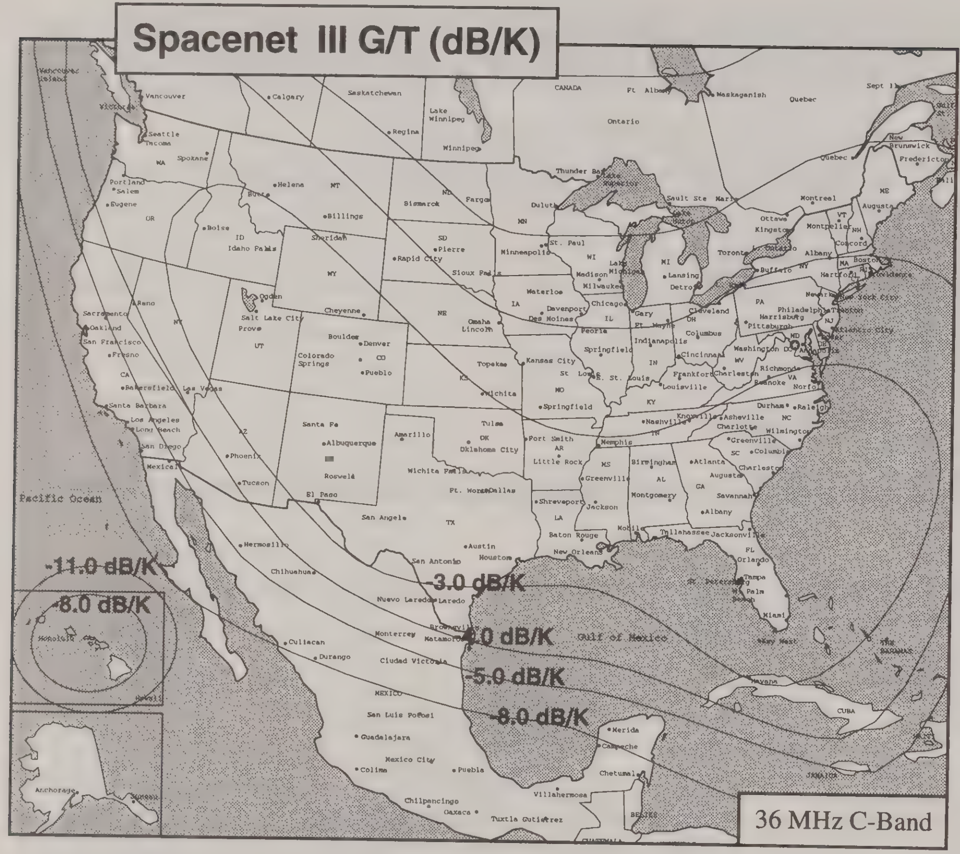
Orbital position:	273ºE (87°W) [III]; 259ºE (101°W) [IV]
Launch:	March 11, 1988, Ariane (III); April 1991, Delta (IV)
Expected lifetime:	10 years
Expected end of life:	1998 (III), 2001 (IV)

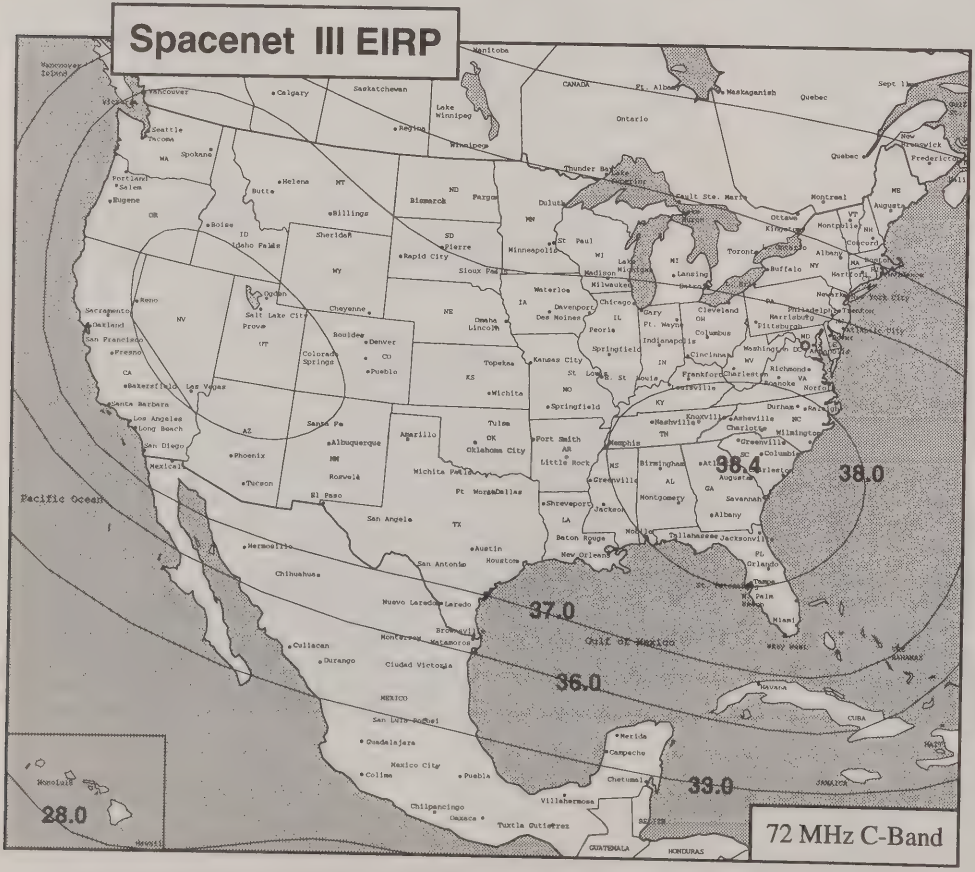
Antennas beam coverage overview

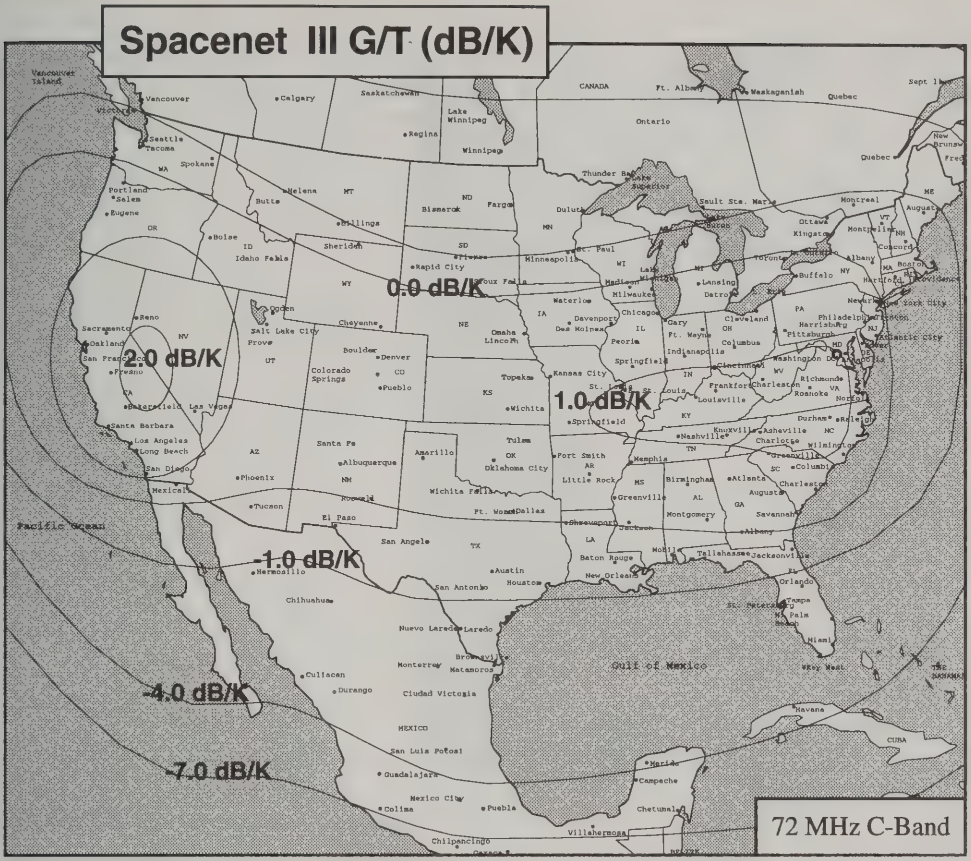
C-band, Ku-band:	USA 50 states



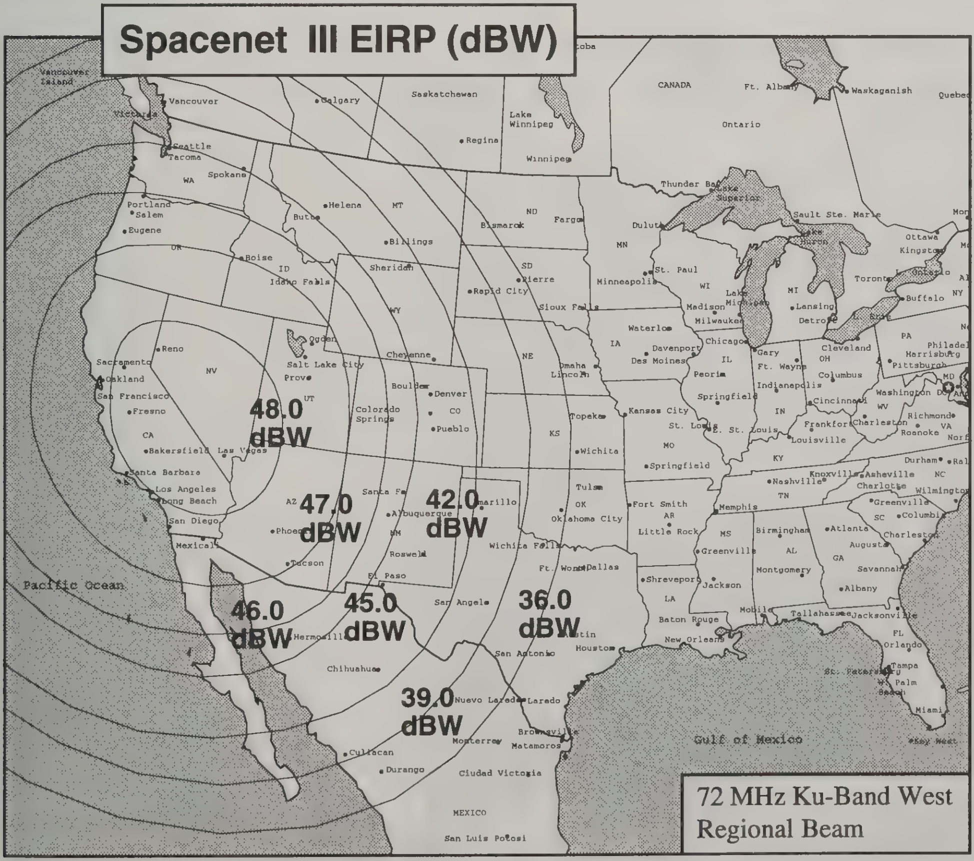
Spacenet III EIRP


Spacenet III G/T (dB/K)

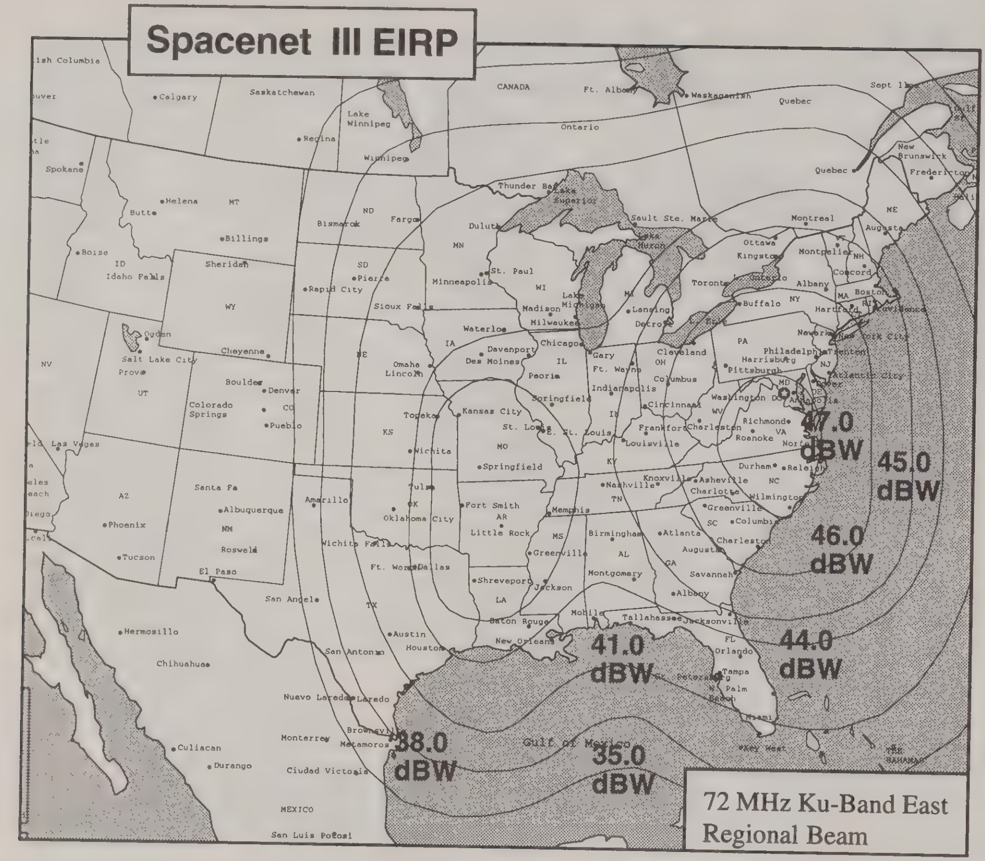

Spacenet III EIRP


Spacenet III G/T (dB/K)

72 MHz C-Band

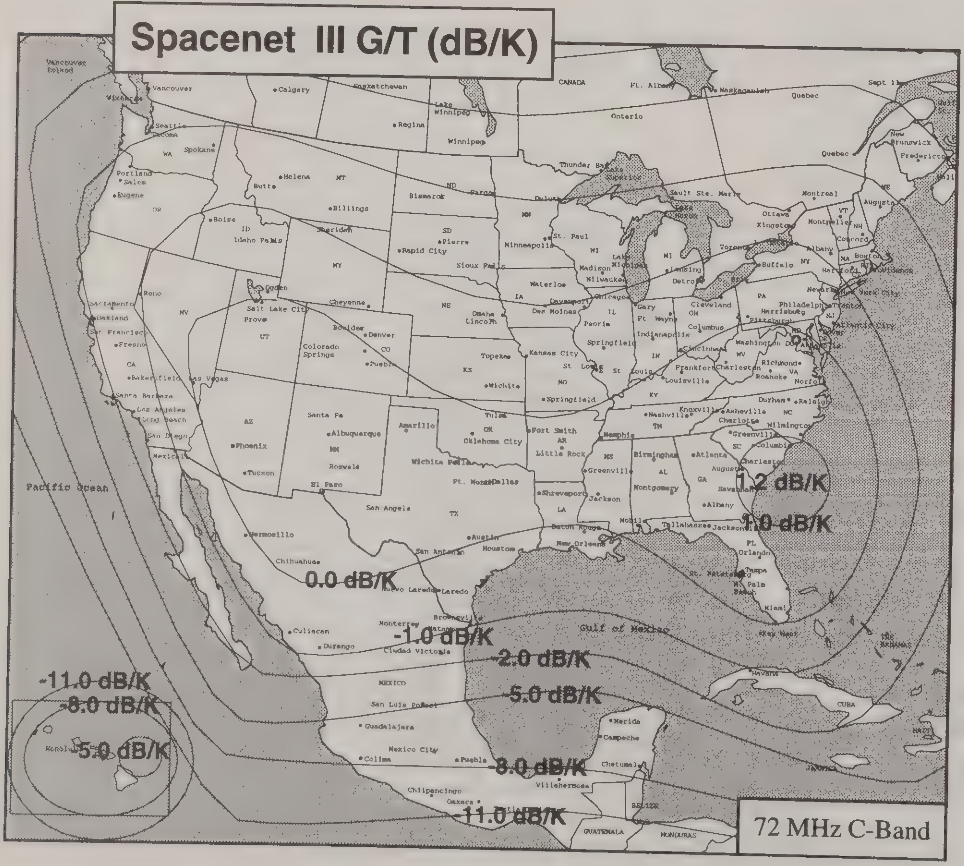

Spacenet III EIRP (dBW)

72 MHz Ku-Band West Regional Beam



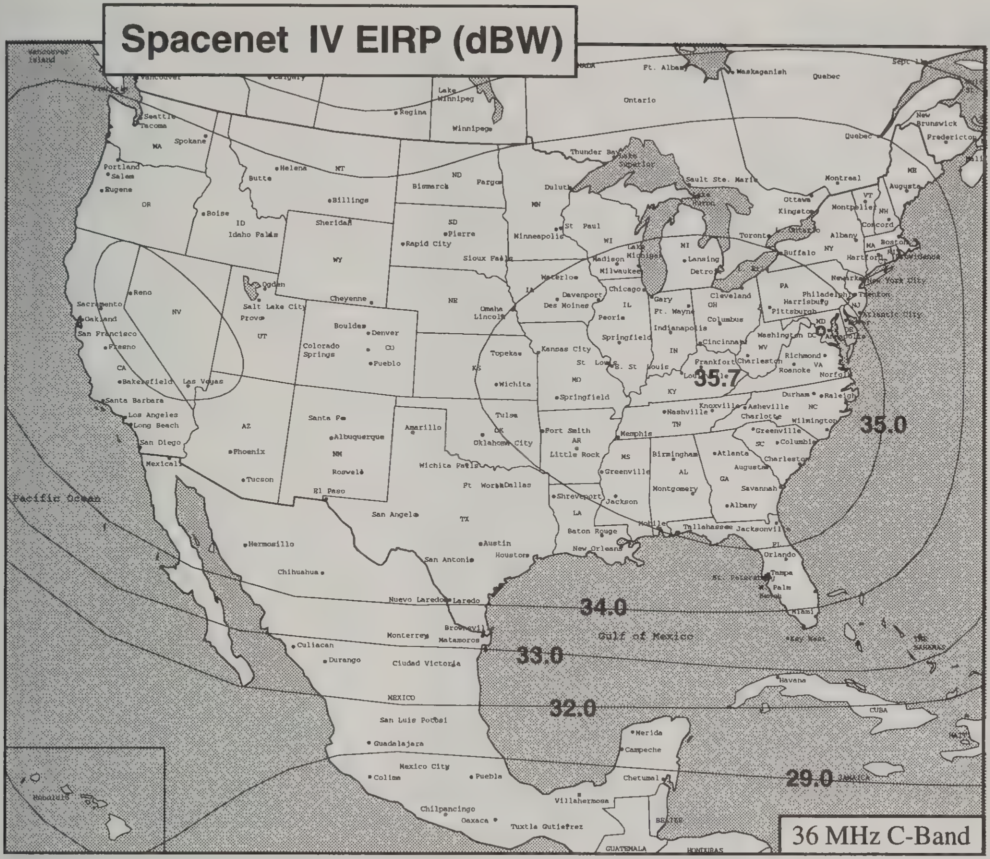
Spacenet III EIRP

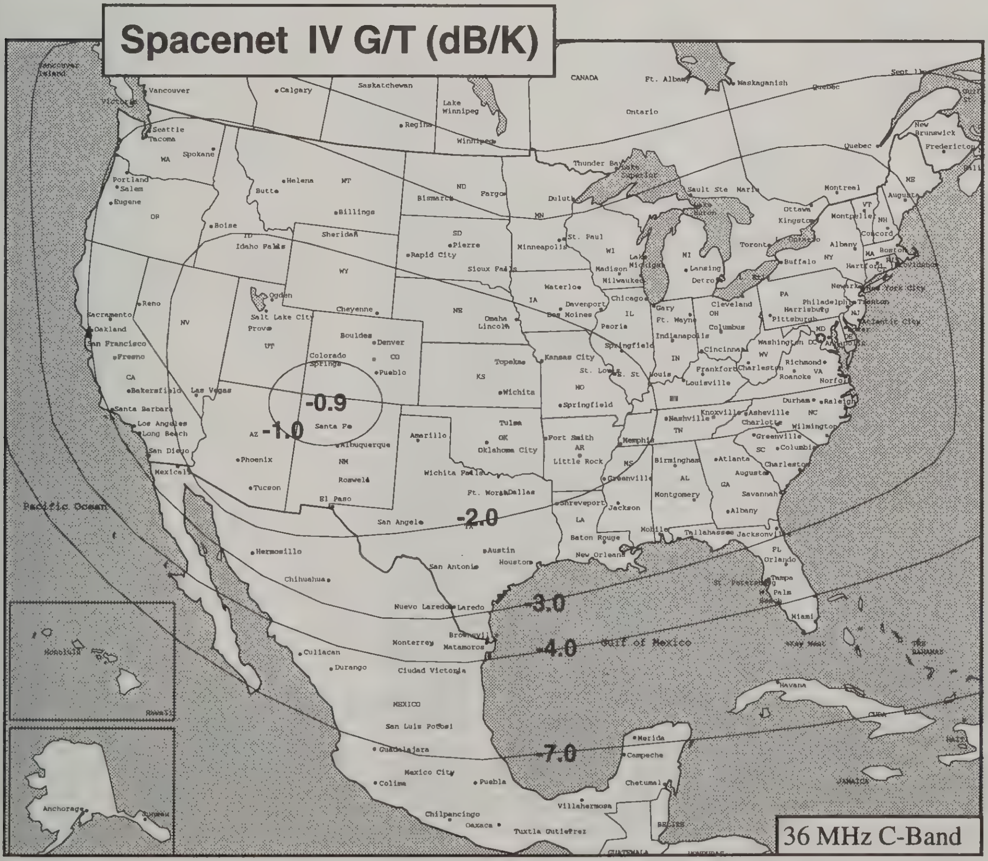
72 MHz Ku-Band East Regional Beam

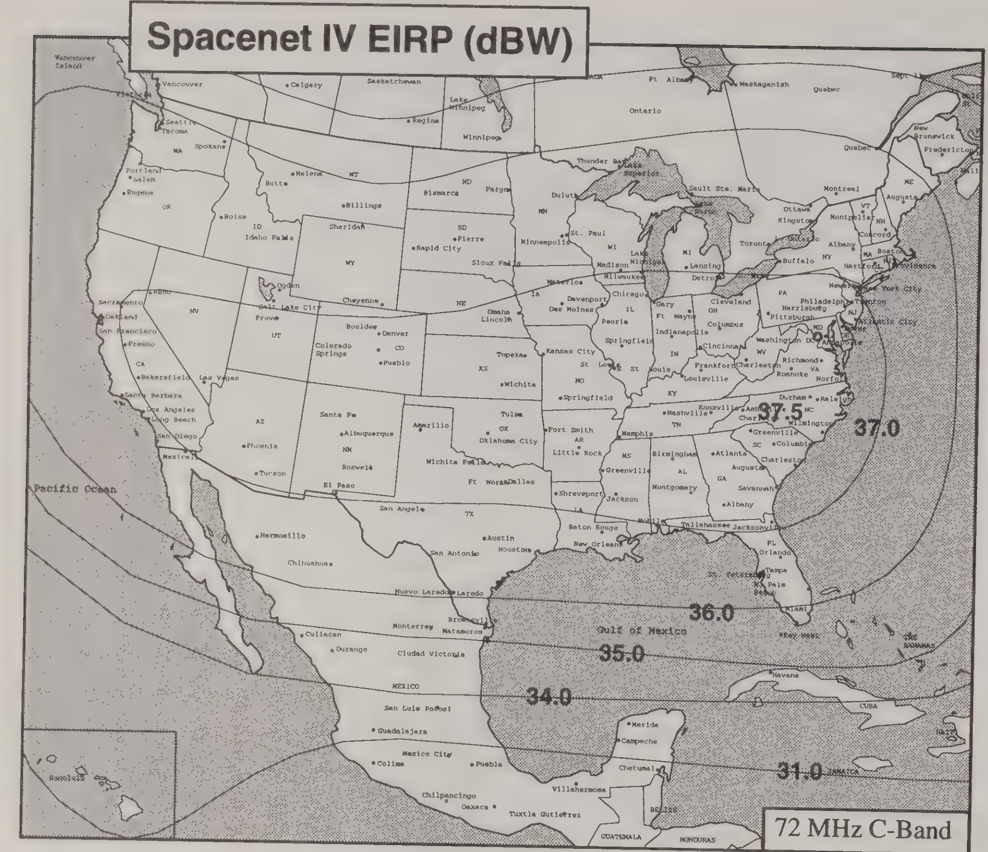


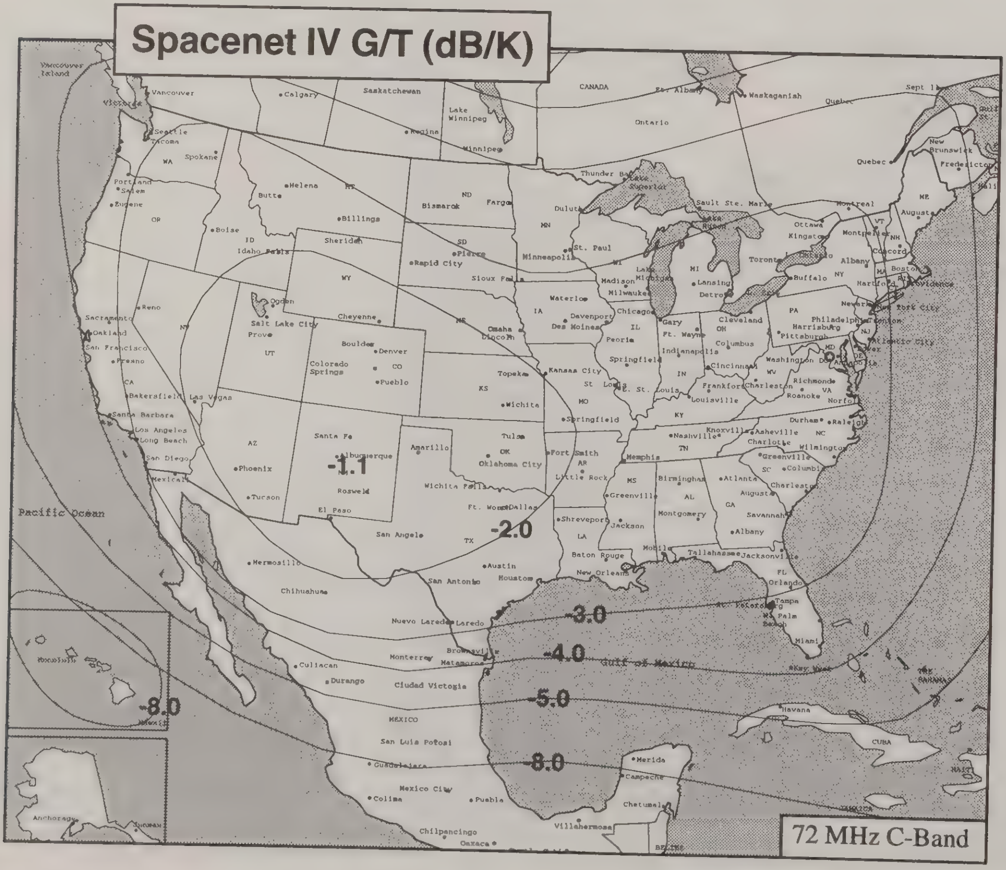
Spacenet III G/T (dB/K)

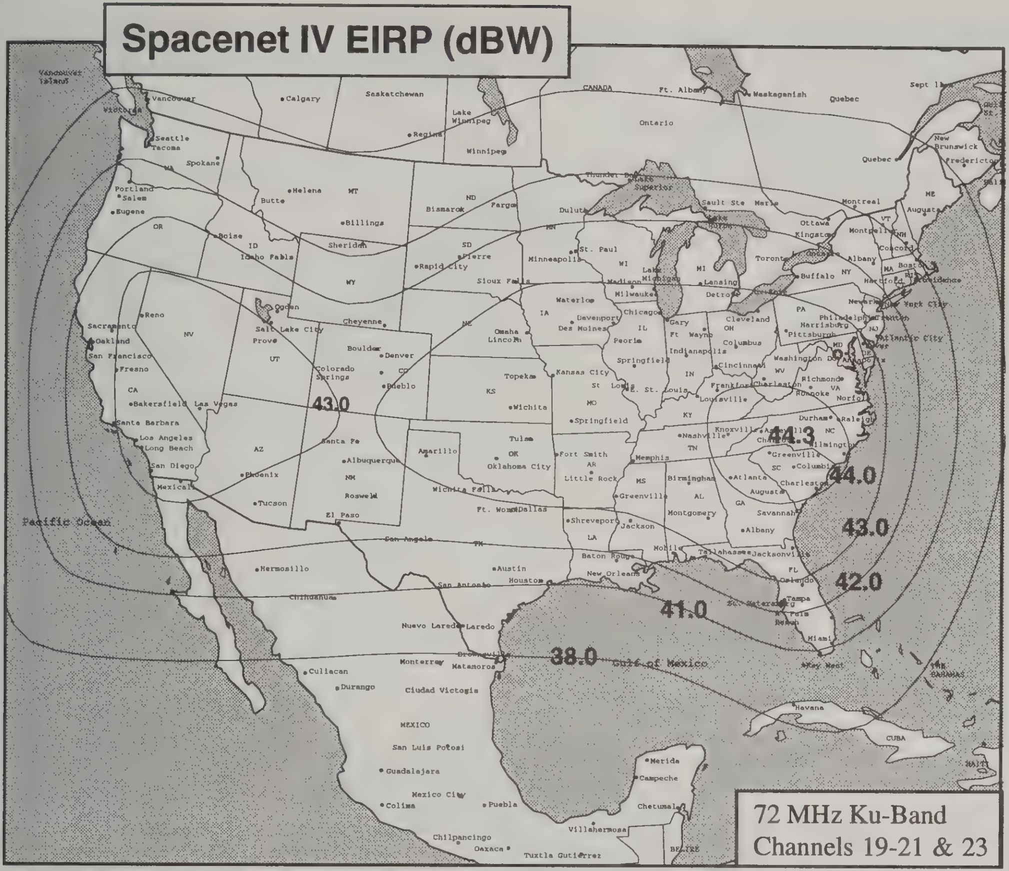
72 MHz C-Band


Spacenet IV EIRP (dBW)

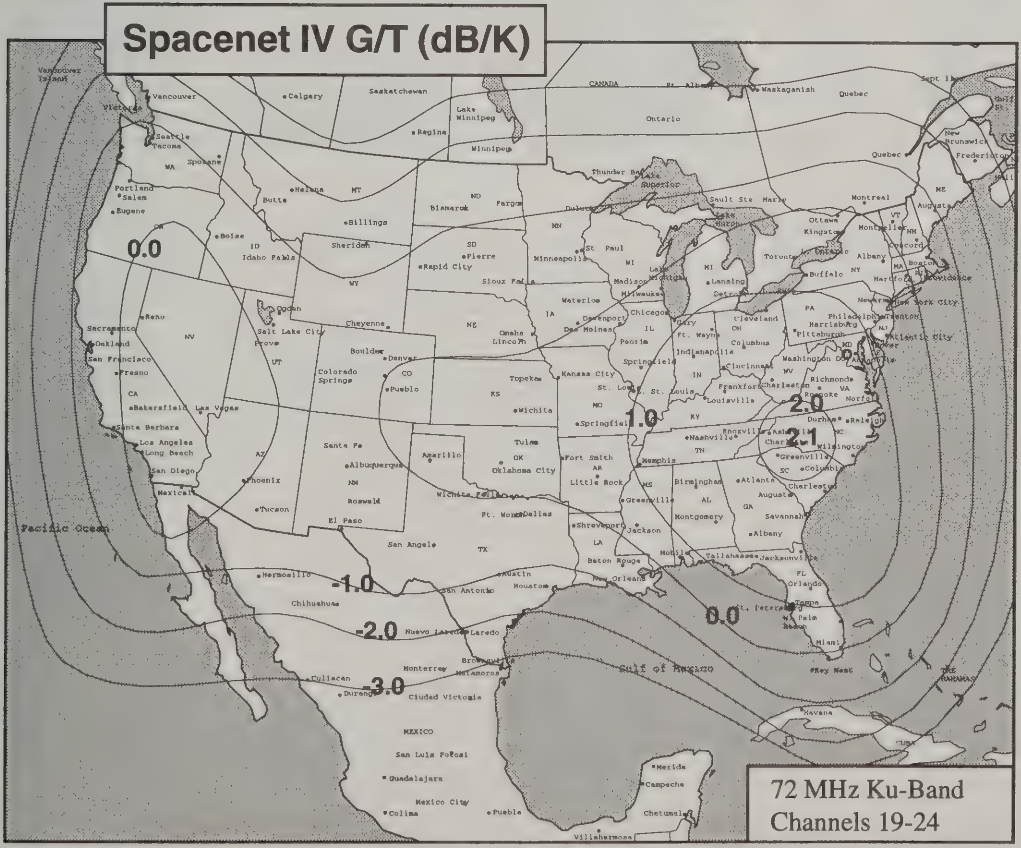

Spacenet IV G/T (dB/K)


Spacenet IV EIRP (dBW)

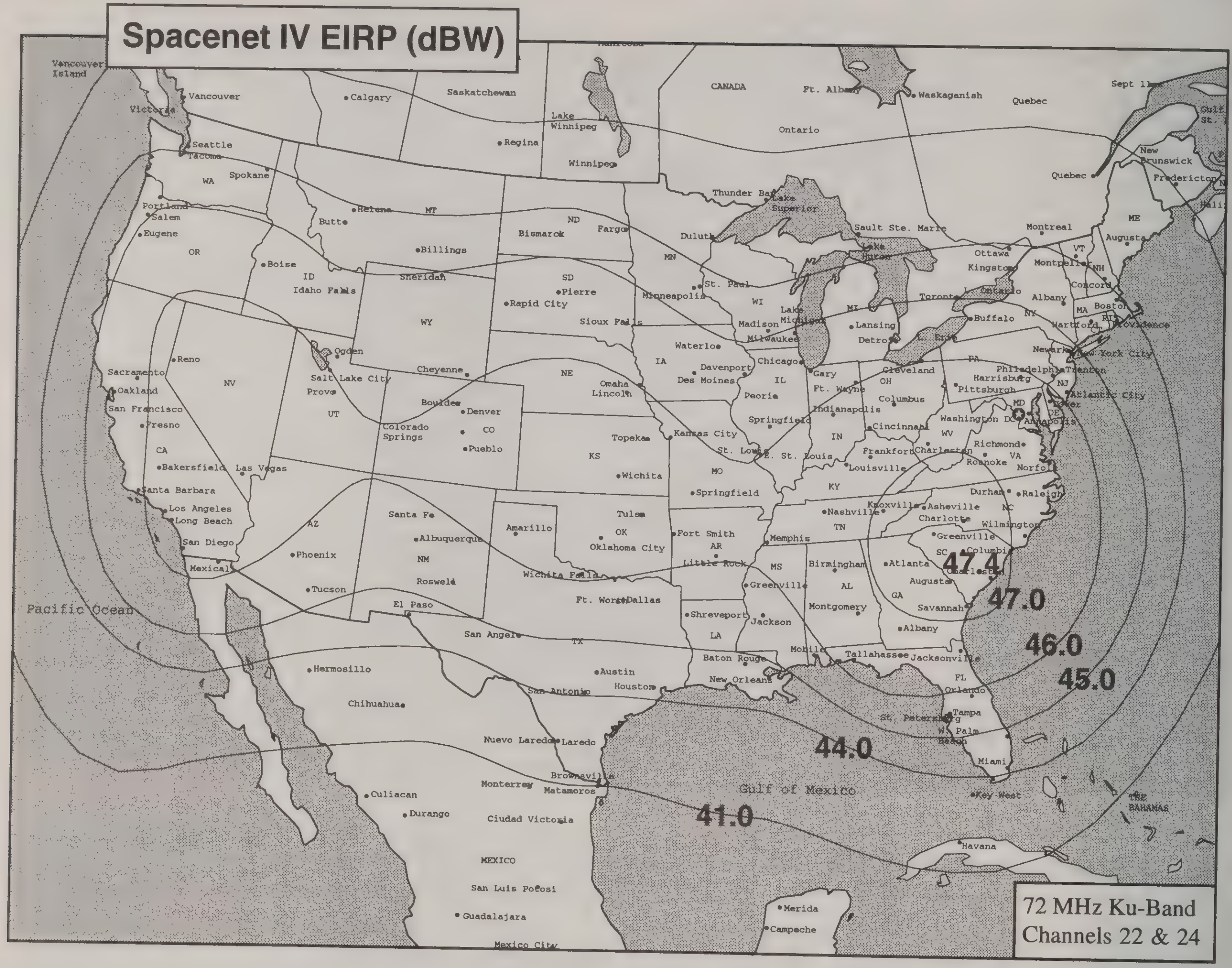

Spacenet IV G/T (dB/K)


Spacenet IV EIRP (dBW)

72 MHz Ku-Band
Channels 19-21 & 23


Spacenet IV G/T (dB/K)

72 MHz Ku-Band
Channels 19-24


Spacenet IV EIRP (dBW)

72 MHz Ku-Band
Channels 22 & 24

GE SYSTEM At A Glance

Satellite name:	GE-1, 257°E (103°W); GE-2, 275°E (85°W)*; GE-3, 233°E (127°W) [to be launched]
Spacecraft data:	
Area of coverage:	USA 50 states
Launch date:	September 9, 1996 (GE-1); January 30, 1997 (GE-2); June 30, 1997 (GE-3)
Launch vehicle:	Atlas IIA (GE-1), Ariane 44L (GE-2)
Transponders:	
Number:	24 C-band, 24 Ku-band
Power output:	12-18 W SSPA (C-band), 60 W TWTA (Ku-band)
Redundancy:	16:12 (C-band), 18:12 (Ku-band)
Manufacturer:	Lockheed Martin Astrospace

*Will replace Satcom K2

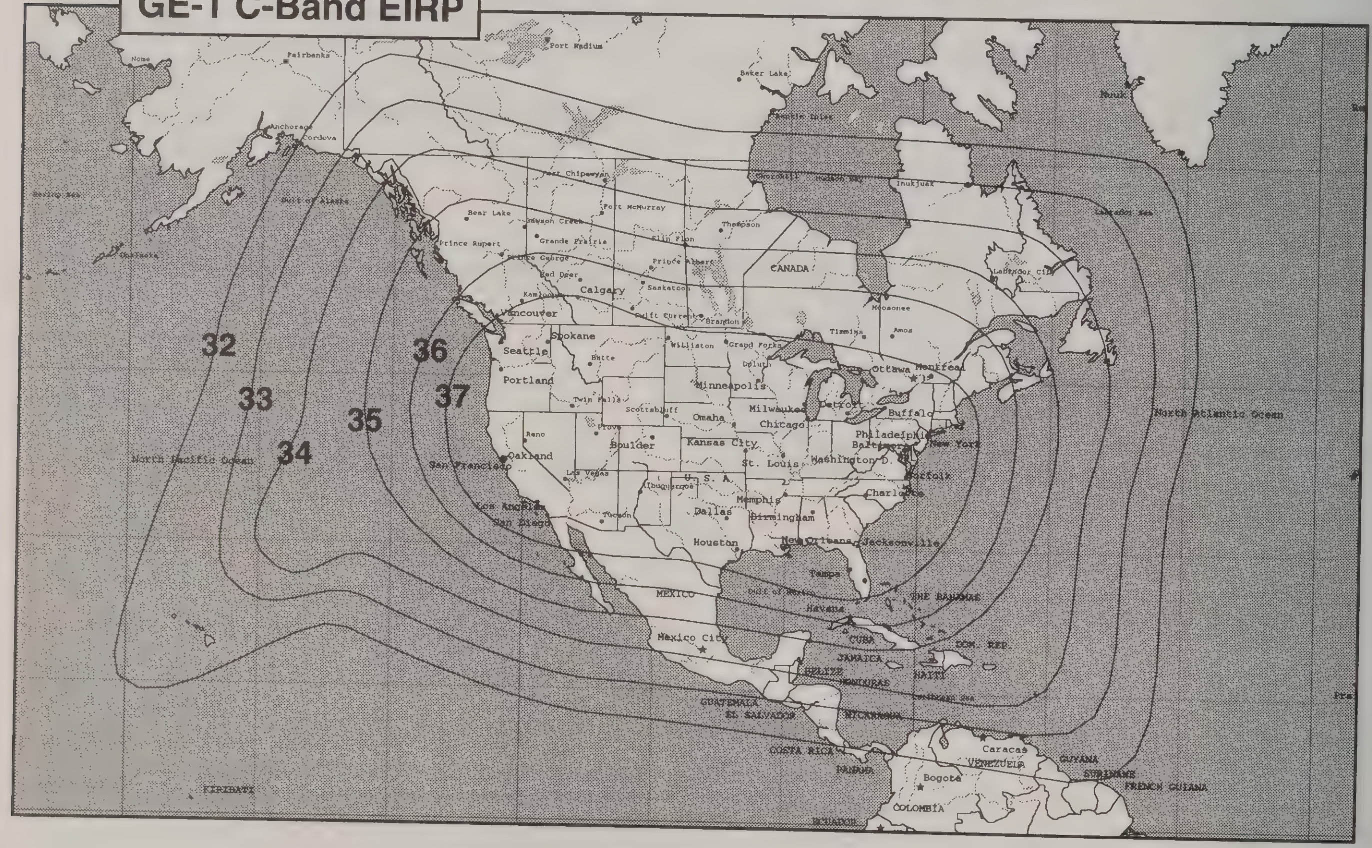
GE-1 and -2

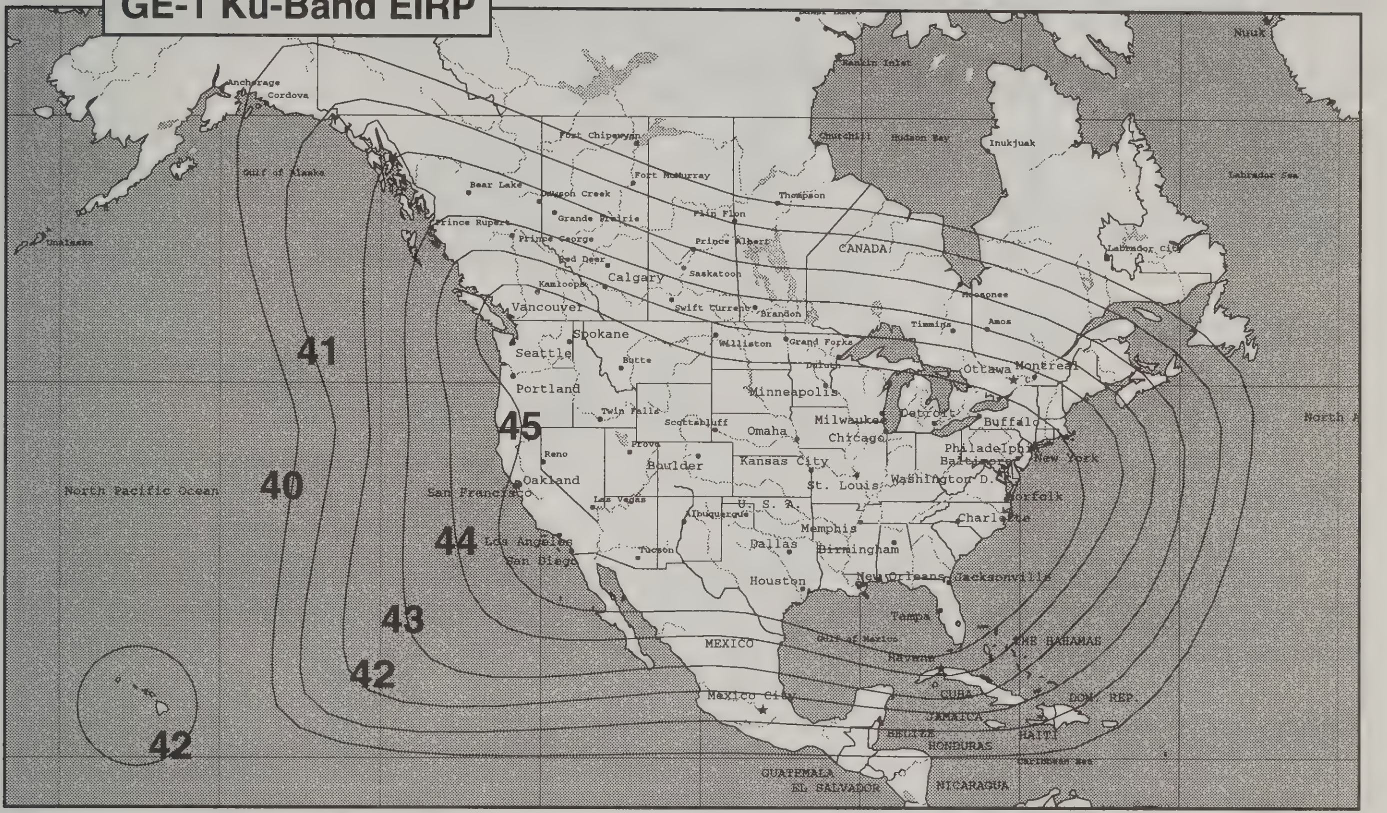
Orbital position:	257°E (103°W) [1]; 275°E (85°W) [2]
Launch:	September 9, 1996, Atlas IIA (1); January 30, 1997, Ariane 44L (2)

Antennas beam coverage overview

C-band, Ku-band:	USA 50 states

GE-1 C-Band EIRP





GE-1 Ku-Band EIRP

HUGHES COMMUNICATIONS INC.

P.O. Box 9712
Long Beach, CA 90810-9928
USA

Telephone:	(310)525-5211
Facsimile:	(310)525-5220
Web Site Address:	www.hcisat.com

Public Relations Contact:

Wendy Greene, Director of Public Affairs, e-mail: wagreene@ccgate.hac.com

Overview:

Owns and operates a satellite fleet providing video, audio and data transmission services. Operates Galaxy, SBS4, SBS5, and SBS6 satellites. Also owner/partner in mobile communications and Spaceway interactive broadband ventures.

Services Offered:

- Leases and sells full-time transponders. Occasional-use, subcarrier and partial transponder capacity also available
- Domestic and international turnkey satellite systems and customized services
- C-band services: transmission for major cable television programmers and network broadcasters via the Galaxy system; video timesharing service (VTS) for occasional users; and end-to-end international television service (ITS) for direct, broadcast-quality audio and video services
- Ku-band services: full-time and occasional-use services provided on SBS4, SBS5, SBS6, Galaxy IV, and Galaxy VII satellites. Capacity available for broadcast television, SNG, business television, distance learning, direct-to-home broadcast, and private business data
- Audio services: single-channel-per-carrier (SPCP) capacity available for distribution of radio and data network programming networks
- Satellite control services: operates spacecraft for other Hughes customers DirecTV, Panamsat and AMSC

Satellite Control Network:

Satellite control:	Long Beach, CA
TT&C stations:	Spring Creek, NY (Galaxy, SBS); Fillmore, CA (Galaxy); Castle Rock, CO (Galaxy, SBS, DBS)

GALAXY SYSTEM At A Glance

Satellite name:	Galaxy IV, 261°E (99°W); Galaxy V, 235°E (125°W); Galaxy VI, 286°E (74°W); Galaxy VII, 269°E (91°W); Galaxy I.R, 227°E (133°W); Galaxy III.R, 265°E (95°W); Galaxy IX, 237°E (123°W); Galaxy X, TBA (to be launched); Galaxy XI, TBA (to be launched)
Spacecraft data:	
Mass (in orbit):	788 kg (Galaxy V, I.R, IX); 584 kg (Galaxy VI); 1,700 kg (Galaxy IV, VII, III.R)
Primary power (EOL):	950 W (Galaxy V, VI, IX); 1050 W (Galaxy I.R); 4300 W (Galaxy IV, VII, III.R)
Eclipse protection:	All transponders
Stabilization:	Spin (V, I.R, VI, IX); Body (Galaxy IV, VII, III.R)
Launch date:	June 1993 (Galaxy IV); March 1992 (Galaxy V); October 1990 (Galaxy VI); October 1992 (Galaxy VII); February 1994 (Galaxy I.R); December 14, 1995 (Galaxy III.R); May 23, 1996 (Galaxy IX); 1998 (Galaxy X); June 1998 (Galaxy XI)
Launch vehicle:	Atlas (I.R, VI), Ariane 42P (IV, VII), Ariane (V), Delta (IX, X), Atlas IIA (III.R)
Expected lifetime:	12 years
Transponders:	
Number:	24
Power output:	16 W TWTA (Galaxy V, I.R); 10 W (Galaxy VI); 16W SSPA C-band, 50W TWTA Ku-band (Galaxy IV, VII, III.R) 20W SSPA C-band(Galaxy IX)
Polarization:	Linear
Redundancy:	5:4 (Galaxy VI); 30:24 (Galaxy V, I.R, IX); 15:12 (Galaxy IV, VII, III.R)
Vertical Uplink G/T:	G/T = -(SFD+86.4) @ 4 dB step attenuation (V); G/T = -(SFD+85.1) @ 0 dB step attenuation (VI); G/T = -(SFD+86) @ 4.4 step attenuation (I.R)
Horizontal Uplink G/T:	G/T = -(SFD+85.1) @ 4 dB step attenuation (V); G/T = -(SFD+85.1) @ 0 dB step attenuation (VI); G/T = -(SFD+85) @ 4.4 step attenuation (III.R)

GALAXY SYSTEM At A Glance (continued)

Single carrier saturation flux density:	Galaxy IV, VII: C-band: -82.8 dBW/sq.m. (Conus) -78 dBW/sq.m. (Alaska) -80 dBW/sq.m. (Hawaii and Caribbean) Ku-band: -90 dBW/sq.m. (Conus) -88 dBW/sq.m.(Alaska, Hawaii and Caribbean) Galaxy V: -87 dBW/sq.m (Conus), -78 dBW/sq.m (Alaska and Hawaii), -80 dBW/sq.m. (Caribbean); Galaxy VI: -82.4 dBW/sq.m (Conus), -78.4 dBW/sq.m. (Alaska), -75.1 dBW/sq.m. (Hawaii and Caribbean); Galaxy I-R: -83.1 dBW/sq.m (Conus), -80.1 dBW/sq.m (Alaska), -78.1 dBW/sq.m (Hawaii), -79.1 dBW/sq.m (Caribbean)
Manufacturer:	Hughes

Galaxy C-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	36	34*	5.945	3.720
2	V	36	34*	5.965	3.740
3	H	36	34*	5.985	3.760
4	V	36	34*	6.005	3.780
5	H	36	34*	6.025	3.800
6	V	36	34*	6.045	3.820
7	H	36	34*	6.065	3.840
8	V	36	34*	6.085	3.860
9	H	36	34*	6.105	3.880
10	V	36	34*	6.125	3.900
11	H	36	34*	6.145	3.920
12	V	36	34*	6.165	3.940
13	H	36	34*	6.185	3.960
14	V	36	34*	6.205	3.980
15	H	36	34*	6.225	4.000
16	V	36	34*	6.245	4.020
17	H	36	34*	6.265	4.040
18	V	36	34*	6.285	4.060
19	H	36	34*	6.305	4.080
20	V	36	34*	6.325	4.100
21	H	36	34*	6.345	4.120
22	V	36	34*	6.365	4.140
23	H	36	34*	6.385	4.160
24	V	36	34*	6.405	4.180

* Galaxy III Conus; Galaxy V Conus: 37 dBW; Galaxy VI Conus: 34.6-39 dBW

Galaxy IV** Ku-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	27	45	14.020	11.720
2	V	54	45	14.050	11.750
3	H	27	45	14.050	11.750
4	H	27	45	14.080	11.780
5	V	54	45	14.110	11.810
6	H	27	45	14.110	11.810
7	H	27	45	14.140	11.840
8	V	54	45	14.170	11.870
9	H	27	45	14.170	11.870
10	H	27	45	14.200	11.900
11	V	54	45	14.230	11.930
12	H	27	45	14.230	11.930
13	H	27	45	14.260	11.960
14	V	54	45	14.290	11.990
15	H	27	45	14.290	11.990
16	H	27	45	14.320	12.020
17*	V	54	45	14.350	12.050
18	H	27	45	14.350	12.050
19	H	27	45	14.380	12.080
20	V	54	45	14.410	12.110
21	H	27	45	14.410	12.110
22	H	27	45	14.440	12.140
23*	V	54	45	14.470	12.170
24	H	27	45	14.470	12.170

* Ku-band channels 17 and 23 can be cross-strapped with C-band channels 18 and 24

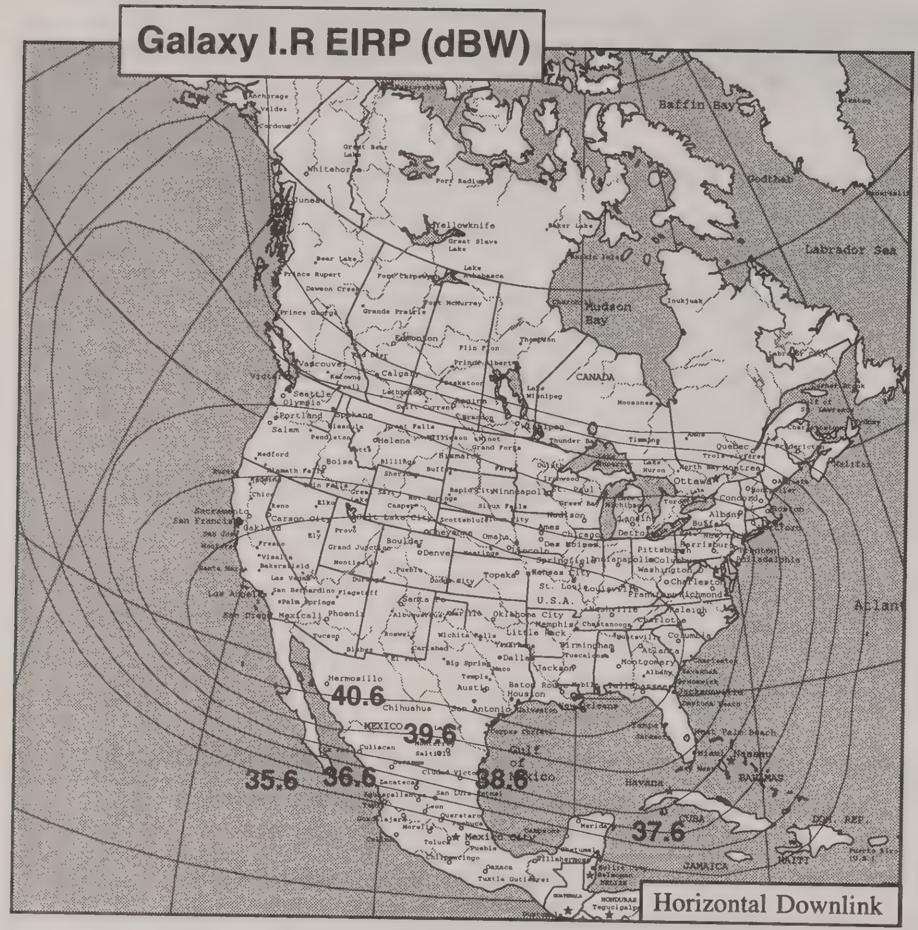
** Galaxy VII transponder polarization is the opposite of Galaxy IV

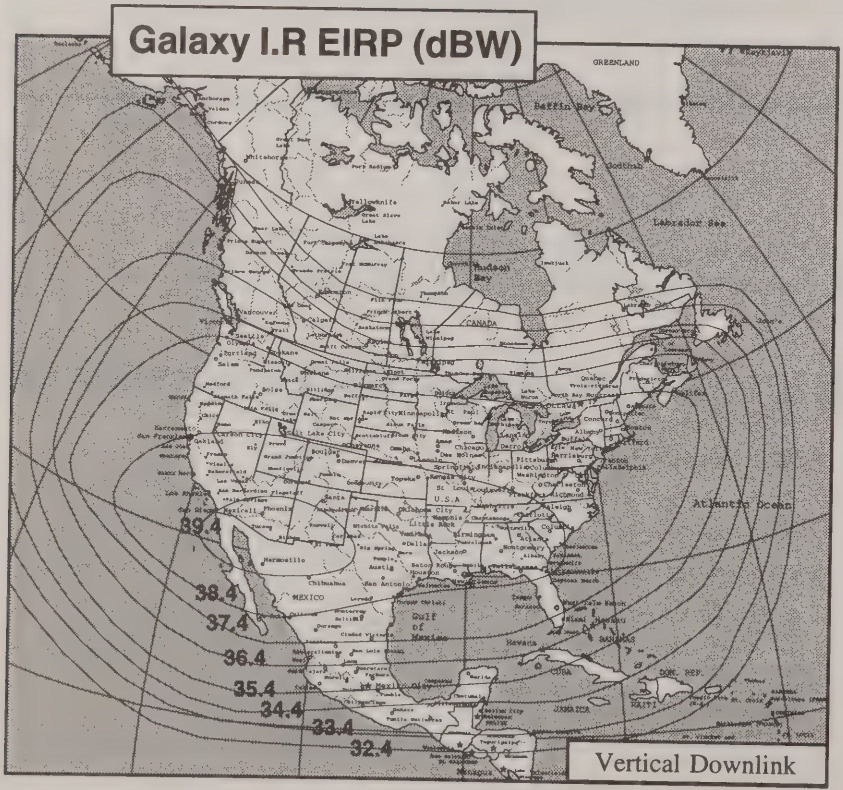
Galaxy I.R, III.R, IV, V, VI, VII, IX

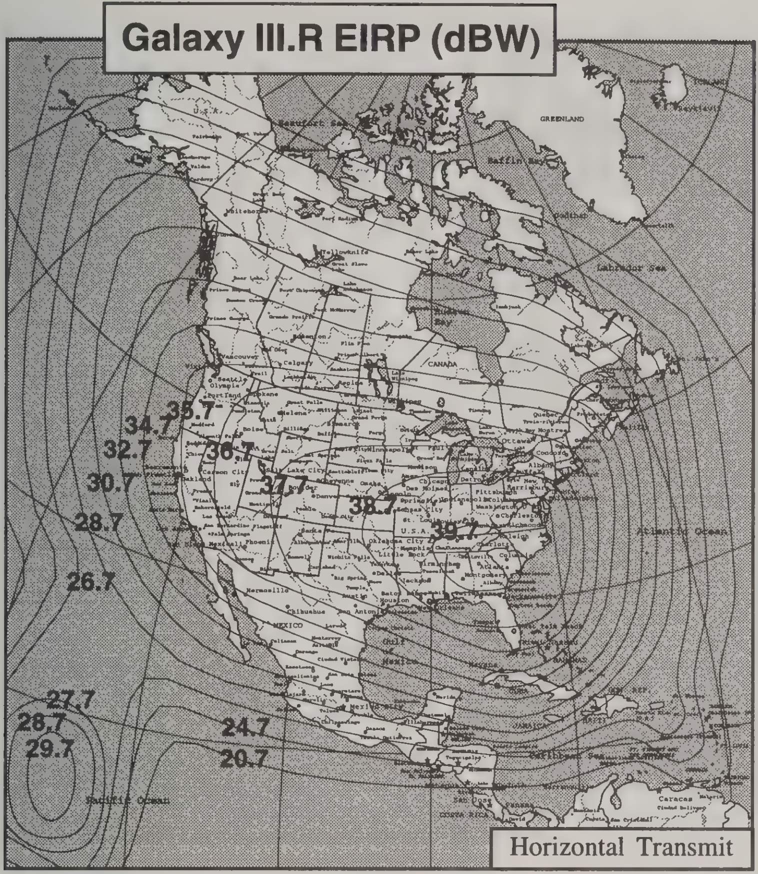
Orbital position:	227°E (133°W) [I.R]; 261°E (99°W) [IV]; 235°E (125°W) [V]; 286°E (74°W) [VI]; 269°E (91°W) [VII]; 237°E (123°W) [IX]; 265°E (95°W) [III.R]
Launch:	February 1994, Atlas (I.R); June 1993, Ariane 42P (IV), March 1992, Ariane (V); October 1990, Atlas (VI); October 1992, Ariane 42P (VII); May 1996, Delta (IX); December 14, 1995, Atlas IIA (III.R)
Expected lifetime:	12 years
Expected end of life:	2006 (I.R), 2005 (IV), 2004 (V), 2002 (VI), 2007 (VII), 2008 (IX), 2007 (III.R)

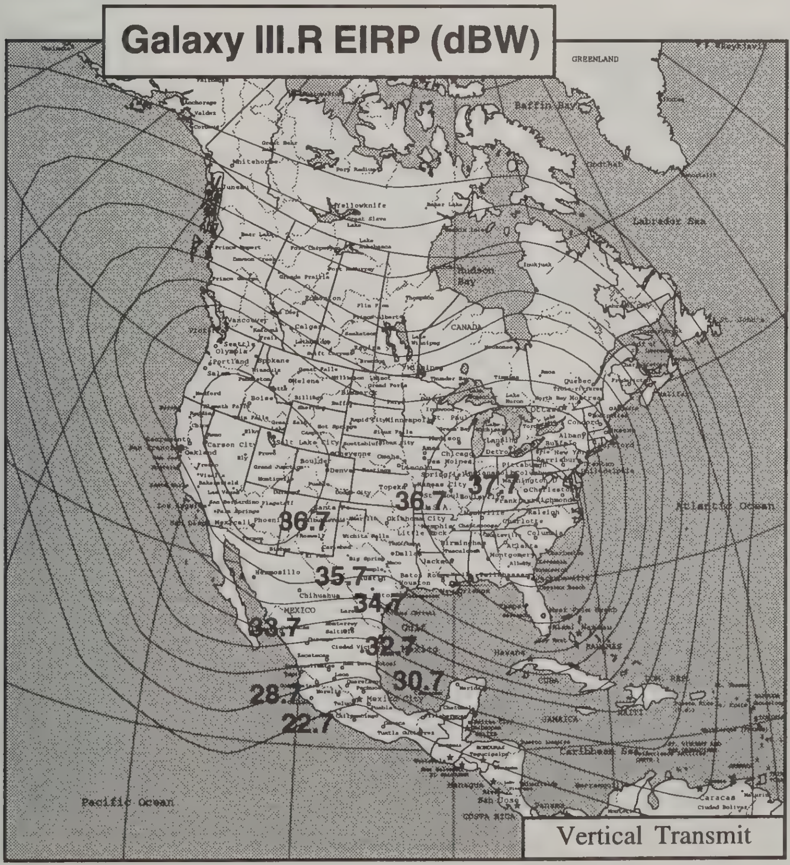
Antennas beam coverage overview:

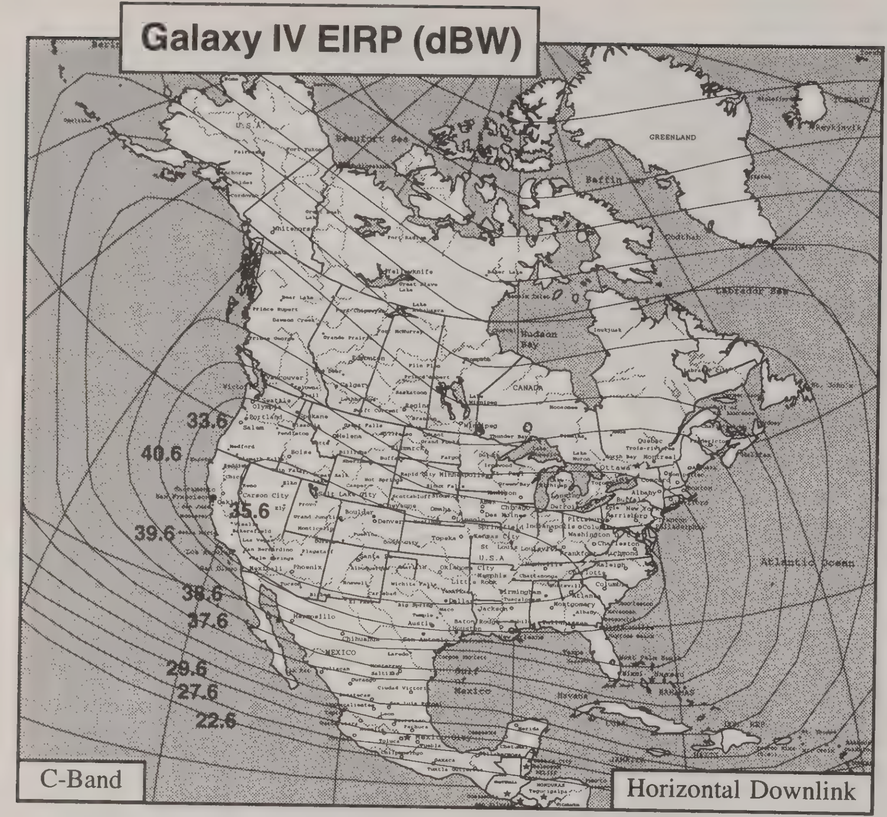
C-band:	USA 50 states and the Caribbean
Ku-band:	Latin America (III.R) - entire Ku-band payload is switchable to cover Brazil and Latin America; may revert to US coverage in 1997, following launch of Galaxy VIII-I (I.R, V, VI, IX, III.R); USA 48 states; services from Alaska, Hawaii and Puerto Rico are available on the horizontal uplink. Switchable CONUS plus offshore EIRP coverage is available on 4 transponders (IV, VII).


Galaxy I.R EIRP (dBW)
40.6
39.6
38.6
37.6
36.6
35.6
Horizontal Downlink


Galaxy I.R EIRP (dBW)
39.4
38.4
37.4
36.4
35.4
34.4
33.4
32.4
Vertical Downlink


Galaxy III.R EIRP (dBW)
35.7
34.7
32.7
36.7
30.7
37.7
38.7
28.7
39.7
26.7
27.7
28.7
29.7
24.7
20.7
GREENLAND
Baffin Bay
Labrador Sea
Hudson Bay
CANADA
U.S.A.
MEXICO
Gulf of Mexico
Atlantic Ocean
Pacific Ocean
Caribbean Sea
Horizontal Transmit

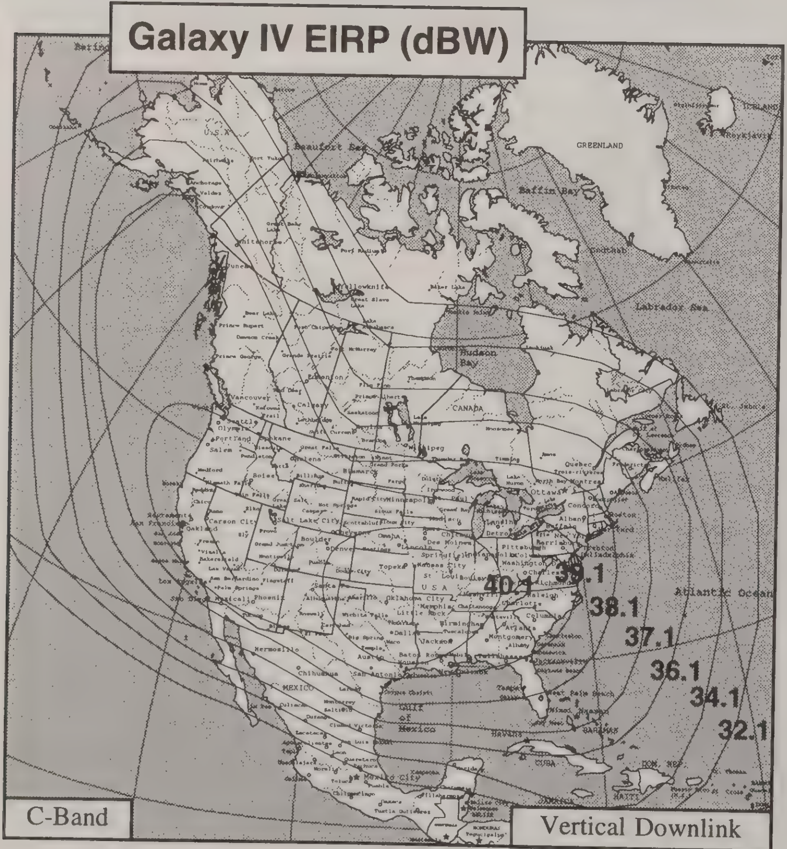

Galaxy III.R EIRP (dBW)
GREENLAND
Baffin Bay
Labrador Sea
Hudson Bay
CANADA
37.7
36.7
36.7
35.7
34.7
33.7
32.7
30.7
28.7
22.7
MEXICO
Atlantic Ocean
Pacific Ocean
Caribbean Sea
Vertical Transmit



Galaxy IV EIRP (dBW)

C-Band

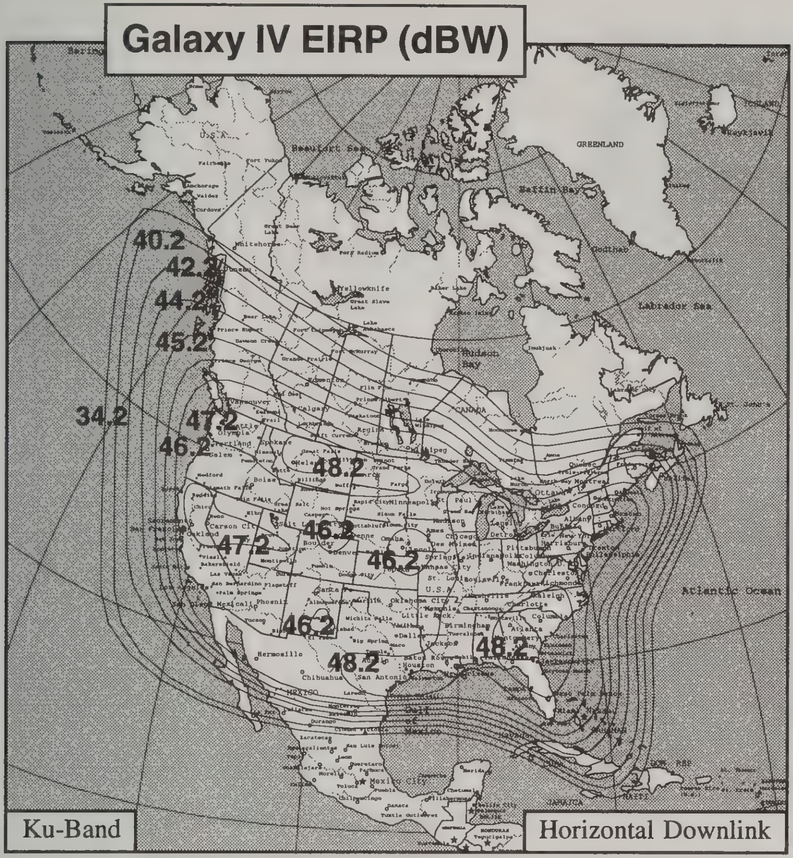
Horizontal Downlink



Galaxy IV EIRP (dBW)

C-Band

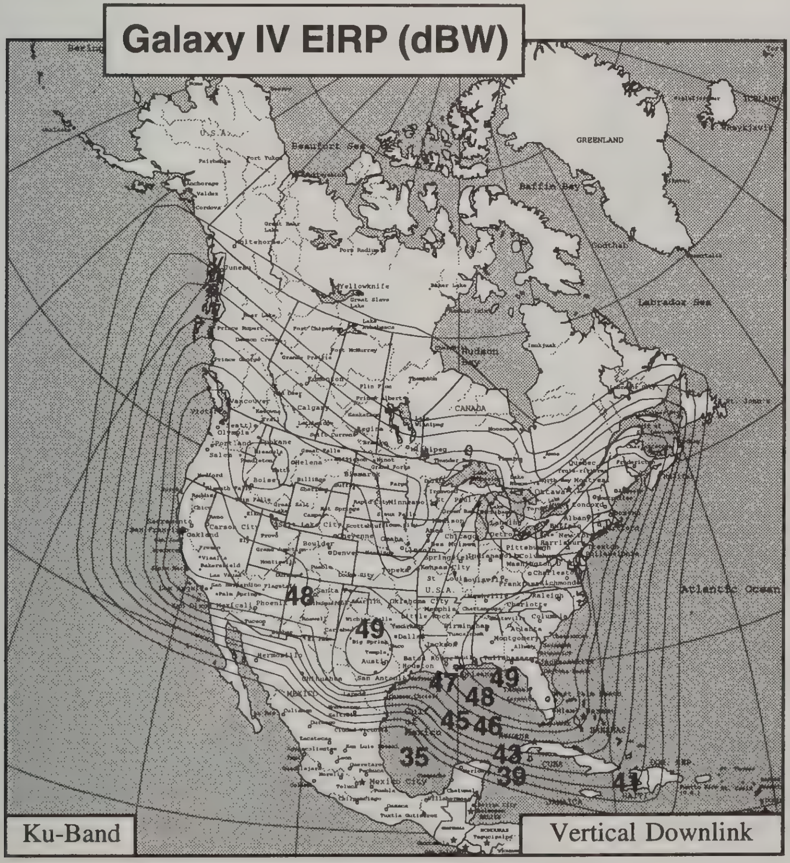
Vertical Downlink



Galaxy IV EIRP (dBW)

Ku-Band

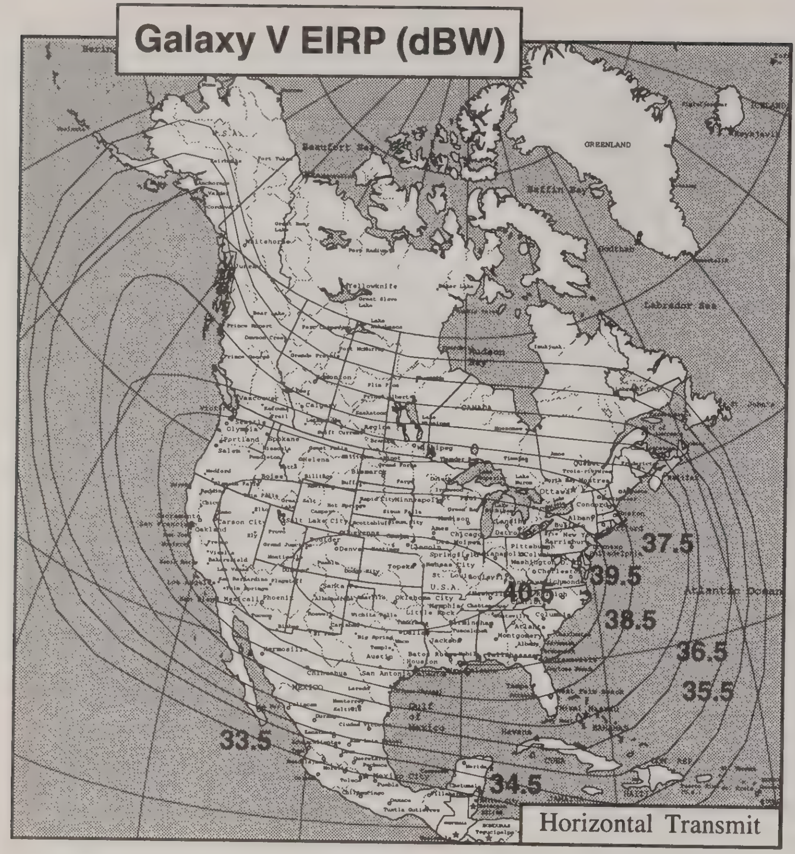
Horizontal Downlink



Galaxy IV EIRP (dBW)

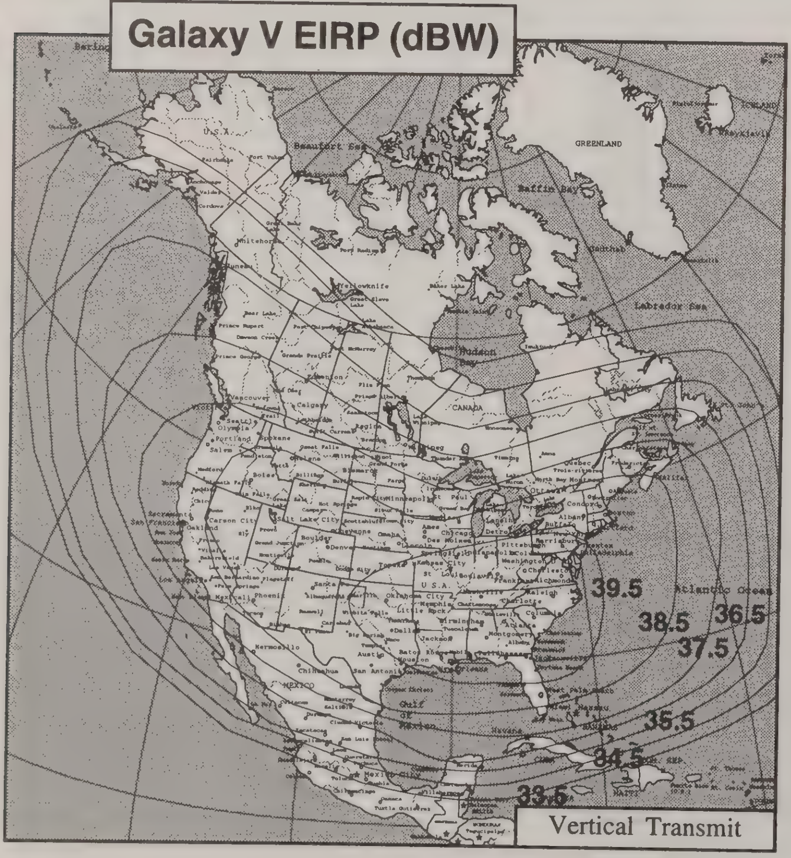
Ku-Band

Vertical Downlink



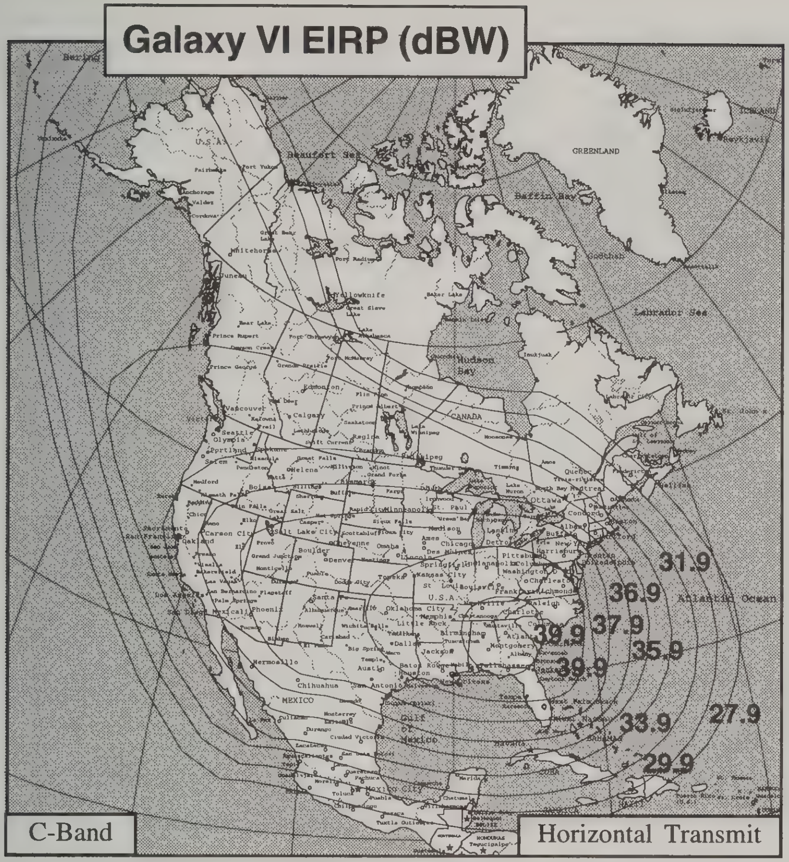
Galaxy V EIRP (dBW)

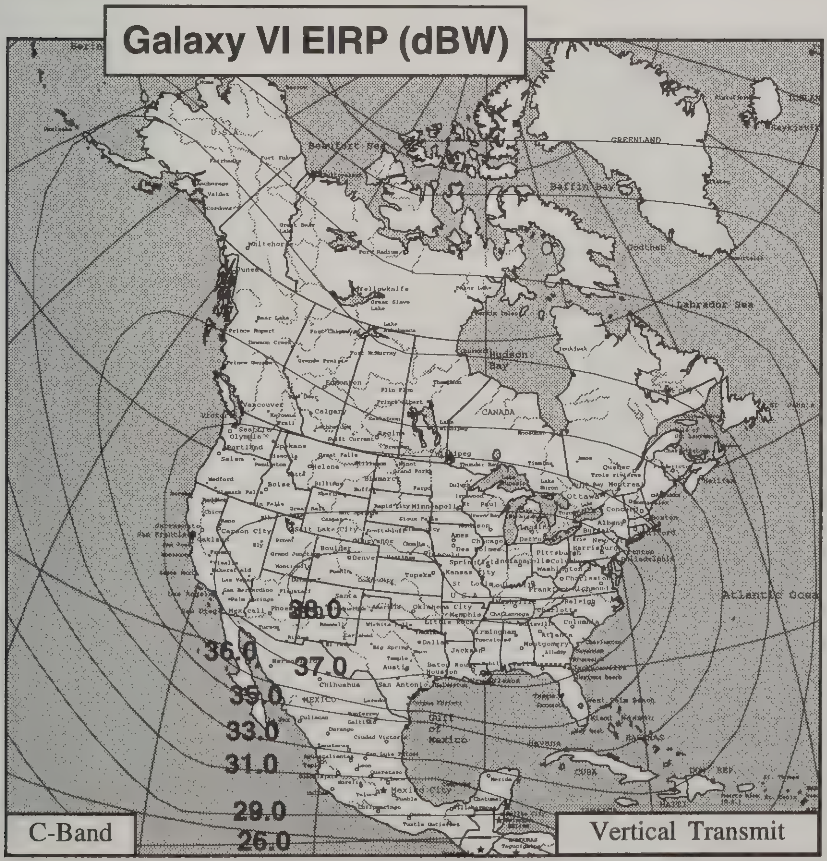
Horizontal Transmit

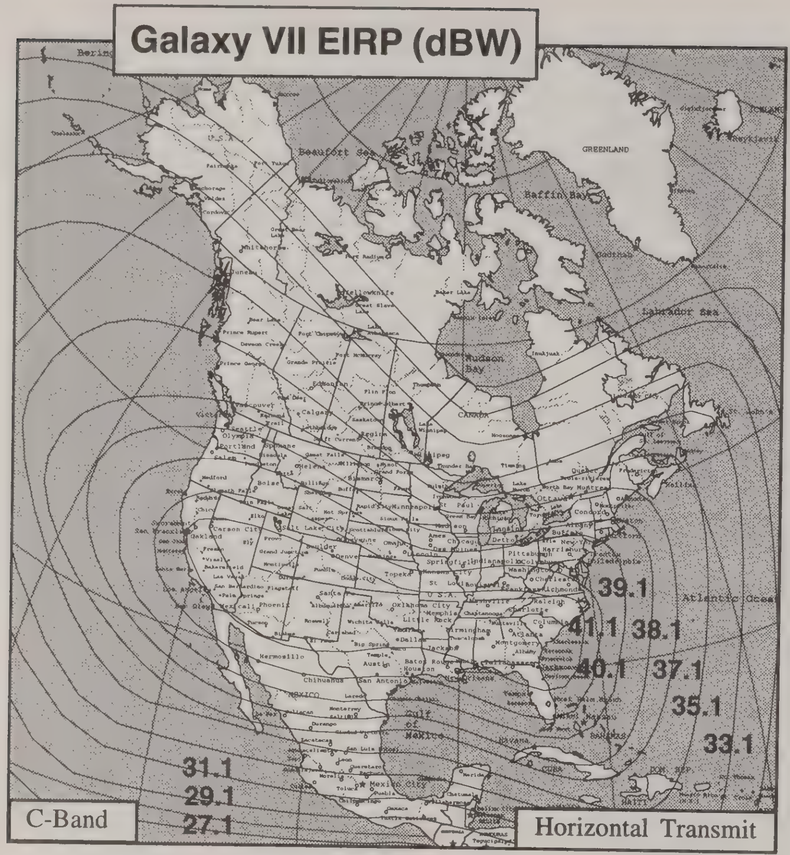


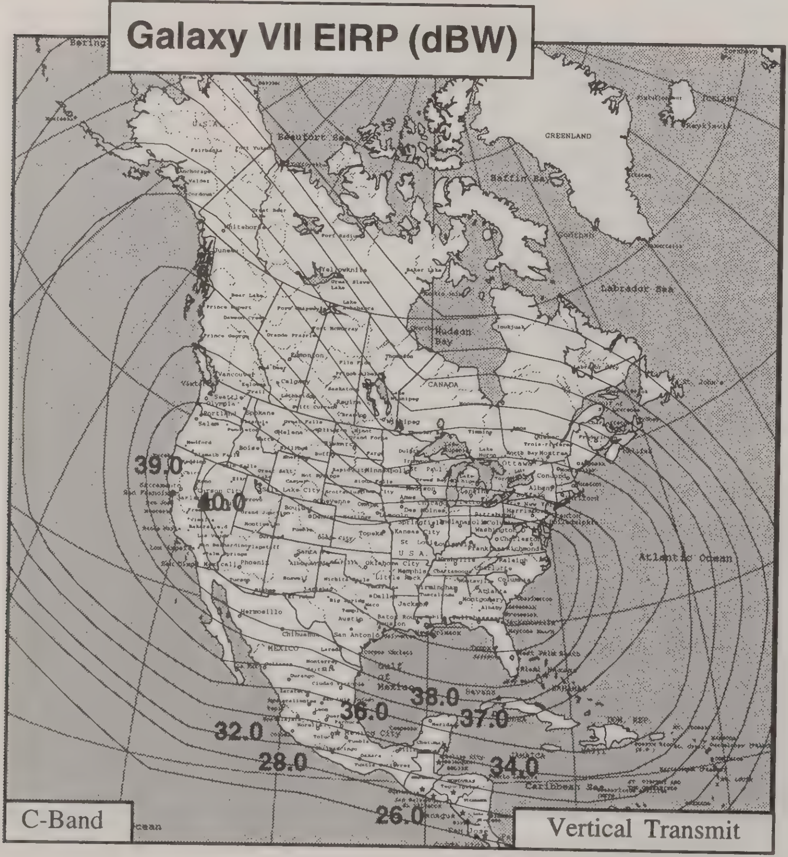
Galaxy V EIRP (dBW)

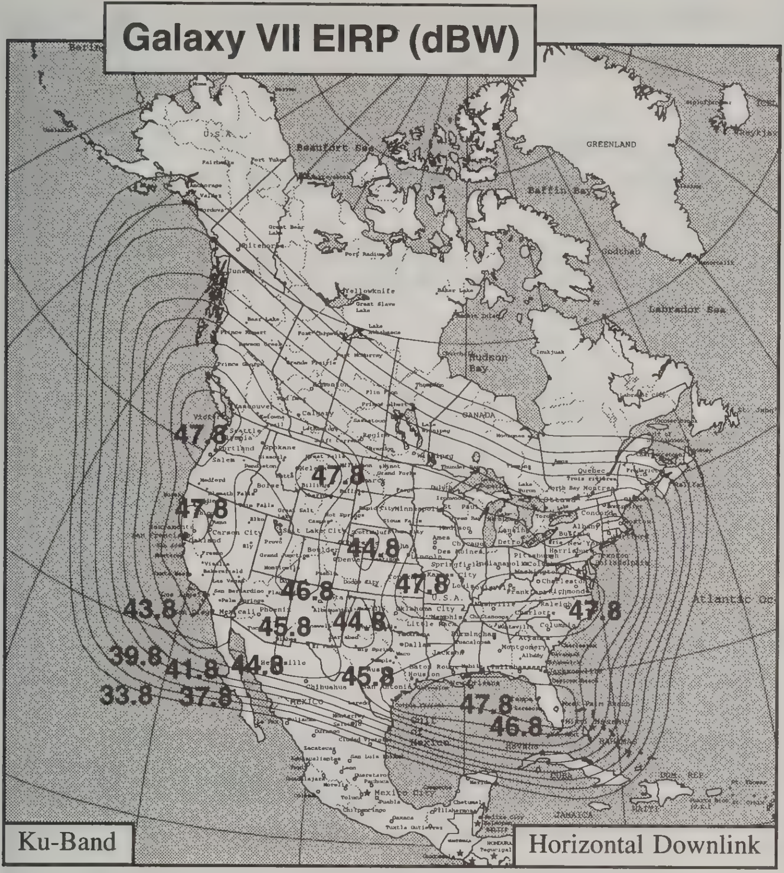
Vertical Transmit

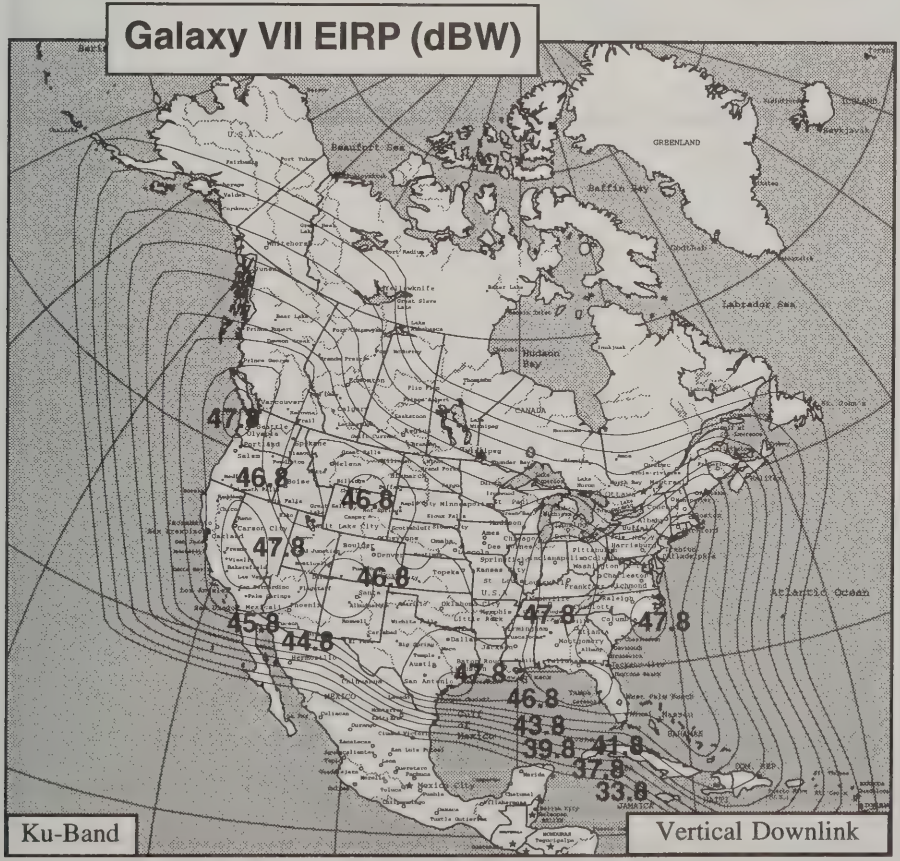

Galaxy VI EIRP (dBW)
31.9
36.9
37.9
39.9
35.9
39.9
33.9
27.9
29.9
C-Band
Horizontal Transmit


Galaxy VI EIRP (dBW)
38.0
36.0
37.0
35.0
33.0
31.0
29.0
26.0
C-Band
Vertical Transmit


Galaxy VII EIRP (dBW)
GREENLAND
Beaufort Sea
Baffin Bay
Labrador Sea
Hudson Bay
CANADA
U.S.A.
MEXICO
Atlantic Ocean
Gulf of Mexico
CUBA
39.1
41.1
38.1
40.1
37.1
35.1
33.1
31.1
29.1
27.1
C-Band
Horizontal Transmit


Galaxy VII EIRP (dBW)
GREENLAND
Beaufort Sea
Baffin Bay
Labrador Sea
Hudson Bay
CANADA
U.S.A.
MEXICO
Atlantic Ocean
Gulf of Mexico
Caribbean Sea
39.0
40.0
38.0
36.0
37.0
32.0
28.0
34.0
26.0
C-Band
Vertical Transmit


Galaxy VII EIRP (dBW)
47.8
47.8
47.8
44.8
46.8
47.8
43.8
45.8
44.8
47.8
39.8
41.8
44.8
45.8
33.8
37.8
47.8
46.8
GREENLAND
CANADA
U.S.A.
MEXICO
Atlantic Oc
Ku-Band
Horizontal Downlink


Galaxy VII EIRP (dBW)
47.8
46.8
46.8
47.8
46.8
47.8
47.8
45.8
44.8
47.8
46.8
43.8
39.8
41.8
37.8
33.8
GREENLAND
CANADA
U.S.A.
MEXICO
Atlantic Ocean
Ku-Band
Vertical Downlink

SBS SYSTEM At A Glance

Satellite name: .... SBS4, 283°E (77°W) [inclined orbit];
SBS5, 237°E (123°W); SBS6, 286°E (74°W)

Spacecraft data:
- Mass (in orbit): .... 622 kg (SBS4); 712 kg (SBS5), 1,485 kg (SBS6)
- Primary power (EOL): .... 820 W (SBS4); 450 W (SBS5); 2250 W (SBS6)
- Eclipse protection: .... All transponders
- Stabilization: .... Spin
- Launch date: .... August 1984 (SBS4);
  September 1988 (SBS5);
  October 1990 (SBS6)
- Launch vehicle: .... NASA (SBS4), Ariane 3 (SBS5), Ariane 44L (SBS6)
- Expected lifetime: .... 10+ years (SBS4, SBS5); 12+ years (SBS6)

Transponders:
- Number: 10 (SBS4); 14 (SBS5); 19 (SBS6)
- Power output: .... 20 W TWTA (SBS4, SBS5),
  41 W TWTA (SBS6)
- Polarization: .... Linear
- Redundancy: 16:10 (SBS4); 24:14 (SBS5);
  30:19 (SBS6)

Single carrier saturation flux density: .... -85 dBW/sq.m. (SBS4, SBS5, Conus)
-82 dBW/sq.m.(SBS6, Conus)

Manufacturer: .... Hughes

SBS4 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	43	47-49	14.025	11.725
2	H	43	47-49*	14.074	11.774
3	H	43	47-49	14.123	11.823
4	H	43	47-49*	14.172	11.872
5	H	43	47-49	14.221	11.921
6	H	43	47-49*	14.270	11.970
7	H	43	47-49	14.319	12.019
8	H	43	47-49*	14.368	12.068
9	H	43	47-49	14.417	12.117
10	H	43	47-49*	14.466	12.166

*Conus; 52 dBW spot beam

SBS5 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	43	47	14.025	11.725
2	H	43	47	14.074	11.774
3	H	43	47	14.123	11.823
4	H	43	47	14.221	11.872
5**	H	43	47*	14.221	11.921
6	H	43	47*	14.270	11.970
7	H	43	47	14.319	12.019
8**	H	43	47*	14.368	12.068
9	H	43	47*	14.417	12.117
10	H	43	47	14.466	12.166
11	V	110	47*	14.062	11.762
12	V	110	47*	14.187	11.887
13	V	110	47*	14.312	12.012
14	V	110	47*	14.437	12.137

* Can be switched to 49 dBW maximum EIRP

** Provide coverage of Alaska and Hawaii or Conus or shared

SBS6 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	43	49-53	14.025	11.725
2	V	43	49-53	14.0495	11.7495
3	H	43	49-53	14.074	11.774
4	V	43	49-53	14.0985	11.7985
5	H	43	49-53	14.123	11.823
6	V	43	49-53	14.1475	11.8475
7	H	43	49-53	14.172	11.872
8	V	43	49-53	14.1965	11.8965
9	H	43	49-53	14.221	11.921
10	V	43	49-53	14.2455	11.9455
11	H	43	49-53	14.270	11.970
12	V	43	49-53	14.2945	11.9945
13	H	43	49-53	14.319	12.019
14	V	43	49-53	14.3435	12.0435
15	H	43	49-53	14.368	12.068
16	V	43	49-53	14.3925	12.0925
17	H	43	49-53	14.417	12.117
18	V	43	49-53	14.4415	12.1415
19	H	43	49-53	14.466	12.166

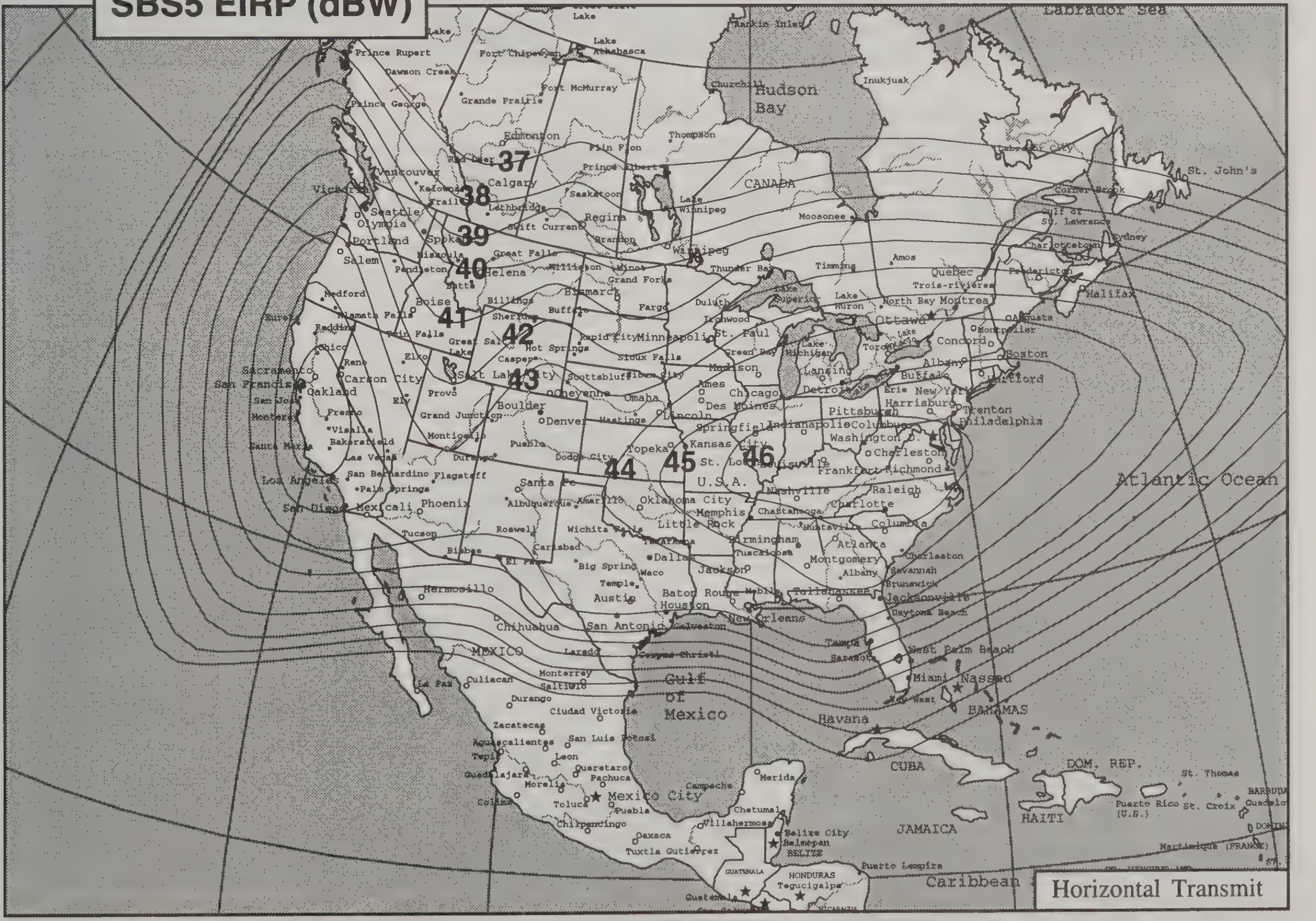
SBS 4, 5 and 6

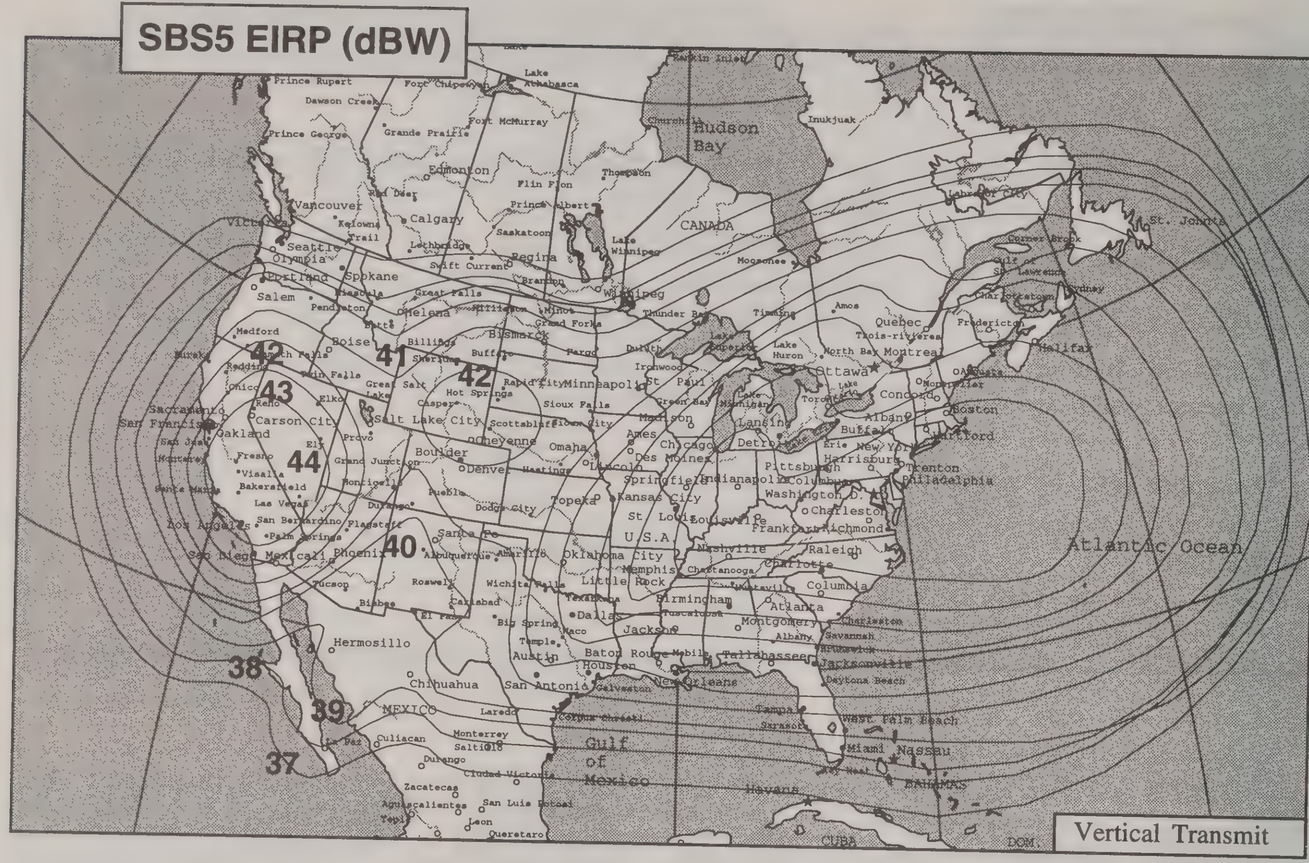
Orbital location:	283°E (77°W) [SBS4]; 237°E (123°W) [SBS5]; 286°E (74°W) [SBS6]
Launch:	August 1984, NASA (SBS4); September 1988, Ariane3 (SBS5); October 1990, Ariane44L (SBS6)
Expected lifetime:	10+ years (SBS4, SBS5); 12+ years (SBS6)
Expected end of life:	2005 (SBS4, SBS6), 1999 (SBS5)

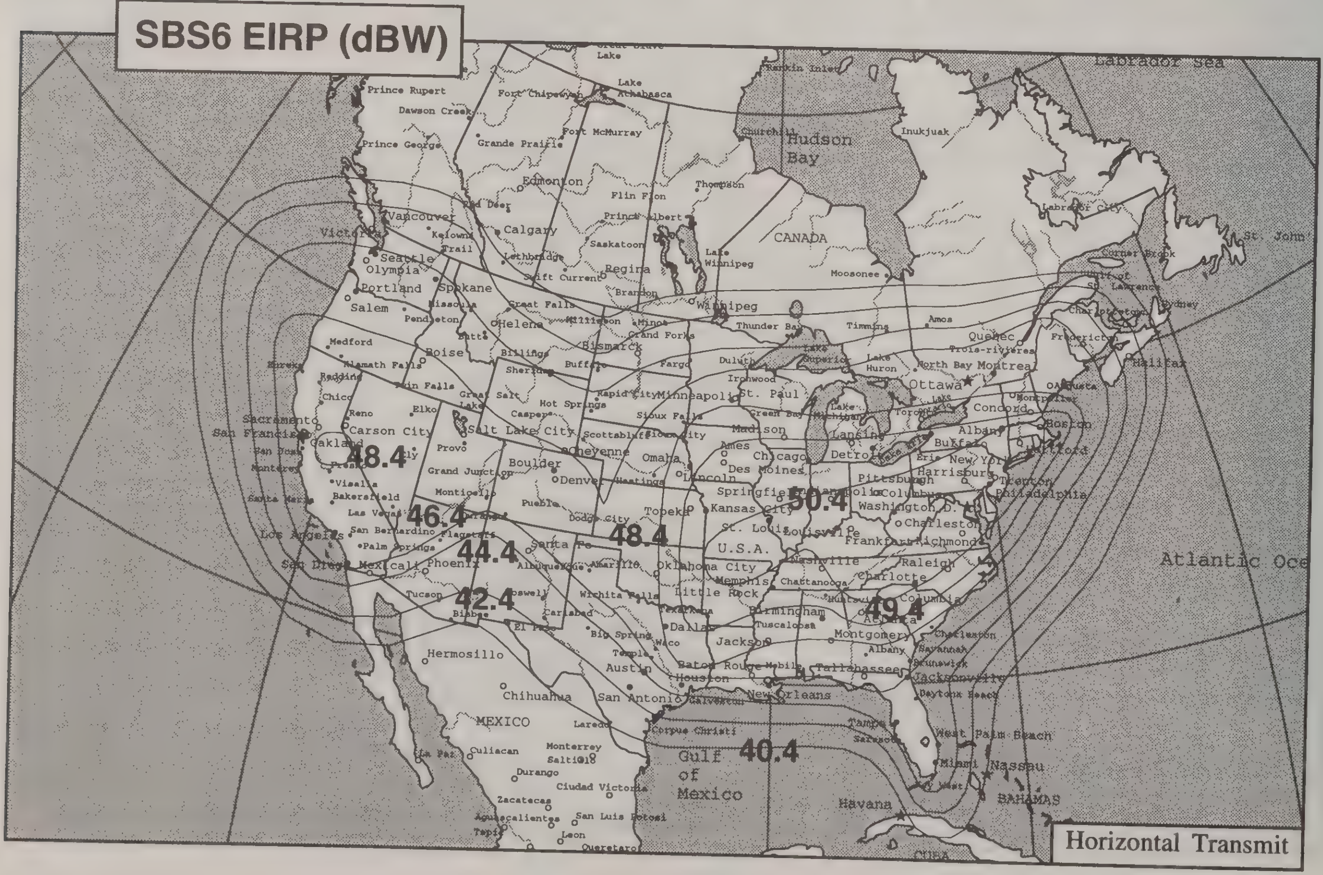
Antennas beam coverage overview:

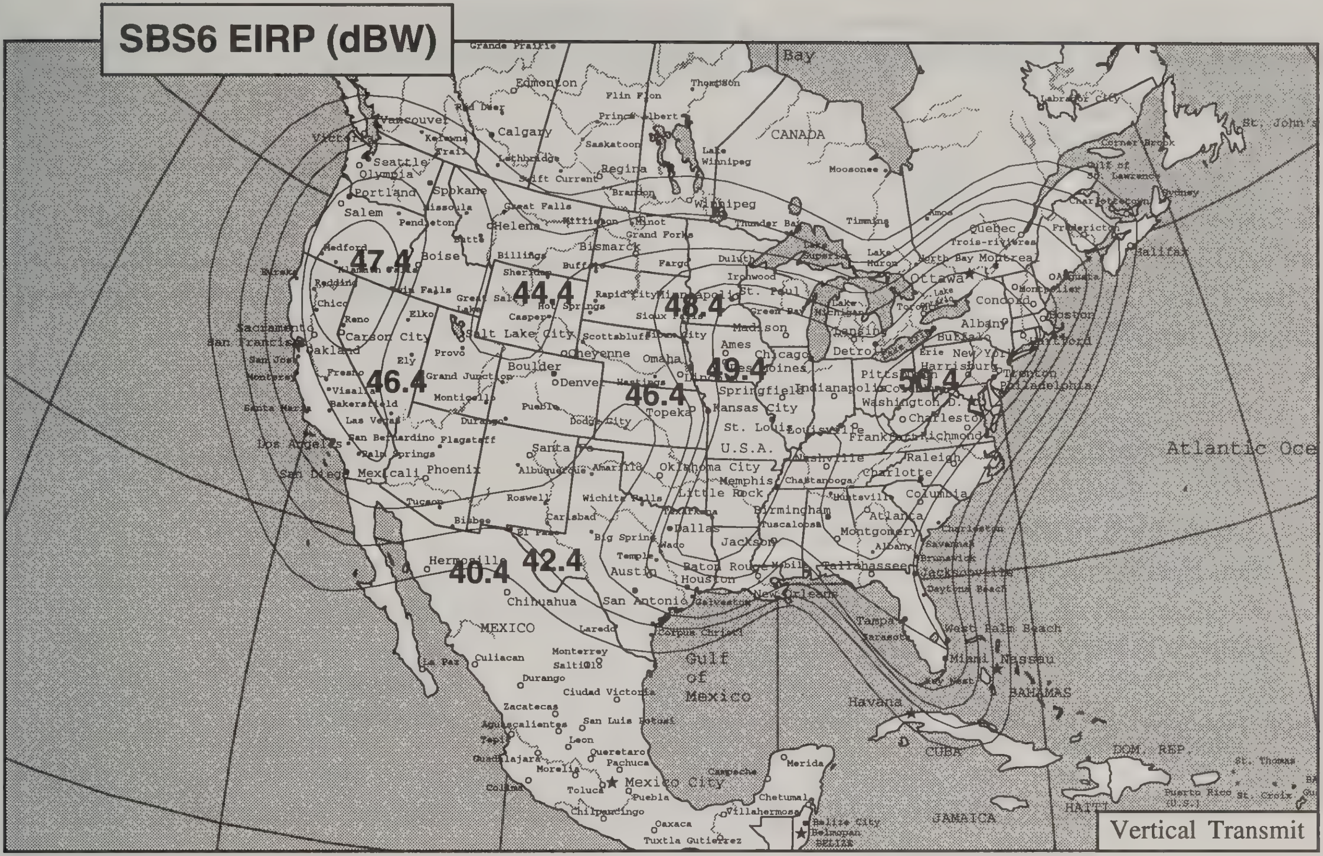
Ku-band:	Conus (SBS4); USA 50 states (SBS5, SBS6)

SBS5 EIRP (dBW)




SBS5 EIRP (dBW)


SBS6 EIRP (dBW)



SBS6 EIRP (dBW)

Vertical Transmit

LORAL SKYNET® SATELLITE SERVICES

#900 Routes 202/206
Room 2A 115W
P.O. Box 752
Bedminster, NJ 07921-0752
USA

Telephone: (800)847-9335
Facsimile: (908)234-7940
Web Site Address: www.att.com/skynet

Booking Contacts:

Bonnie Larson, Skynet Satellite Services
Tim Harrington, Skynet Global Video Services, AT&T Tridom, (404)514-1737
Kathleen Devlin, Skynet International Dedicated Services, (201)644-8130
Hawley Earth Station, (800)242-2422

Public Relations Contact:

David Thompson, (908)221-4178

Overview:

Provides satellite-based long-distance communications services through its Telstar series of satellites. Services include both one-way and two-way analog and digital data, image and voice transmission.

Services Offered:

- Full- or part-time C-band 36 MHz transponder services - Telstar 300 satellites
- Full- or part-time C-band and Ku-band service - Telstar 400 satellites
- Full- or part-time television services
- Shared or dedicated C-band data, video and voice services
- Private line digital connectivity using Ku-band and VSAT technology
- Bulk data transport
- One-way point-to-multipoint Ku-band broadcast video networking service

Satellite Control Network:

Satellite control: Hawley, PA

TT&C stations: Hawley, PA; Three Peaks, CA

TELSTAR 3 SYSTEM At A Glance

Satellite name:	Telstar 302, 275°E* (85°W); Telstar 303, 237°E** (123°W)
Spacecraft data:	
Mass (in orbit):	650 kg
Primary power (EOL):	670 W
Eclipse protection:	All transponders
Stabilization:	Spin
Launch date:	August 30, 1984 (302); June 17, 1985 (303)
Launch vehicle:	Discovery 162 (302); Discovery 192 (303)
Expected lifetime:	10 years (exceeded)
Transponders:	
Number:	24
Power output:	5.5 W TWTA and SSPA (HPAs)
Polarization:	Linear
Redundancy:	4:2 Receivers, 5:4 HPAs
G/T:	-3.0 dB/K CONUS (Nominal)
Single carrier saturation flux density:	-72.7 to -84.7 dBW/sq.m. in 4 dB steps
Manufacturer:	Hughes Space and Communications

* Satellite operating in inclined orbit mode since January 1, 1995

**Satellite operating in inclined orbit mode since June 1, 1995

Telstar 3 Transponder Frequency Plan

Tr.#	Pol.*	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1[1]	V	36	34	5.945	3.720
1[2]	H	36	34	5.965	3.740
2[3]	V	36	34	5.985	3.760
2[4]	H	36	34	6.005	3.780
3[5]	V	36	34	6.025	3.800
3[6]	H	36	34	6.045	3.820
4[7]	V	36	34	6.065	3.840
4[8]	H	36	34	6.085	3.860
5[9]	V	36	34	6.105	3.880
5[10]	H	36	34	6.125	3.900
6[11]	V	36	34	6.145	3.920
6[12]	H	36	34	6.165	3.940
7[13]	V	36	34	6.185	3.960
7[14]	H	36	34	6.205	3.980
8[15]	V	36	34	6.225	4.000
8[16]	H	36	34	6.245	4.020
9[17]	V	36	34	6.265	4.040
9[18]	H	36	34	6.285	4.060
10[19]	V	36	34	6.305	4.080
10[20]	H	36	34	6.325	4.100
11[21]	V	36	34	6.345	4.120
11[22]	H	36	34	6.365	4.140
12[23]	V	36	34	6.385	4.160
12[24]	H	36	34	6.405	4.180

* Uplink and downlink have the same polarization sense.

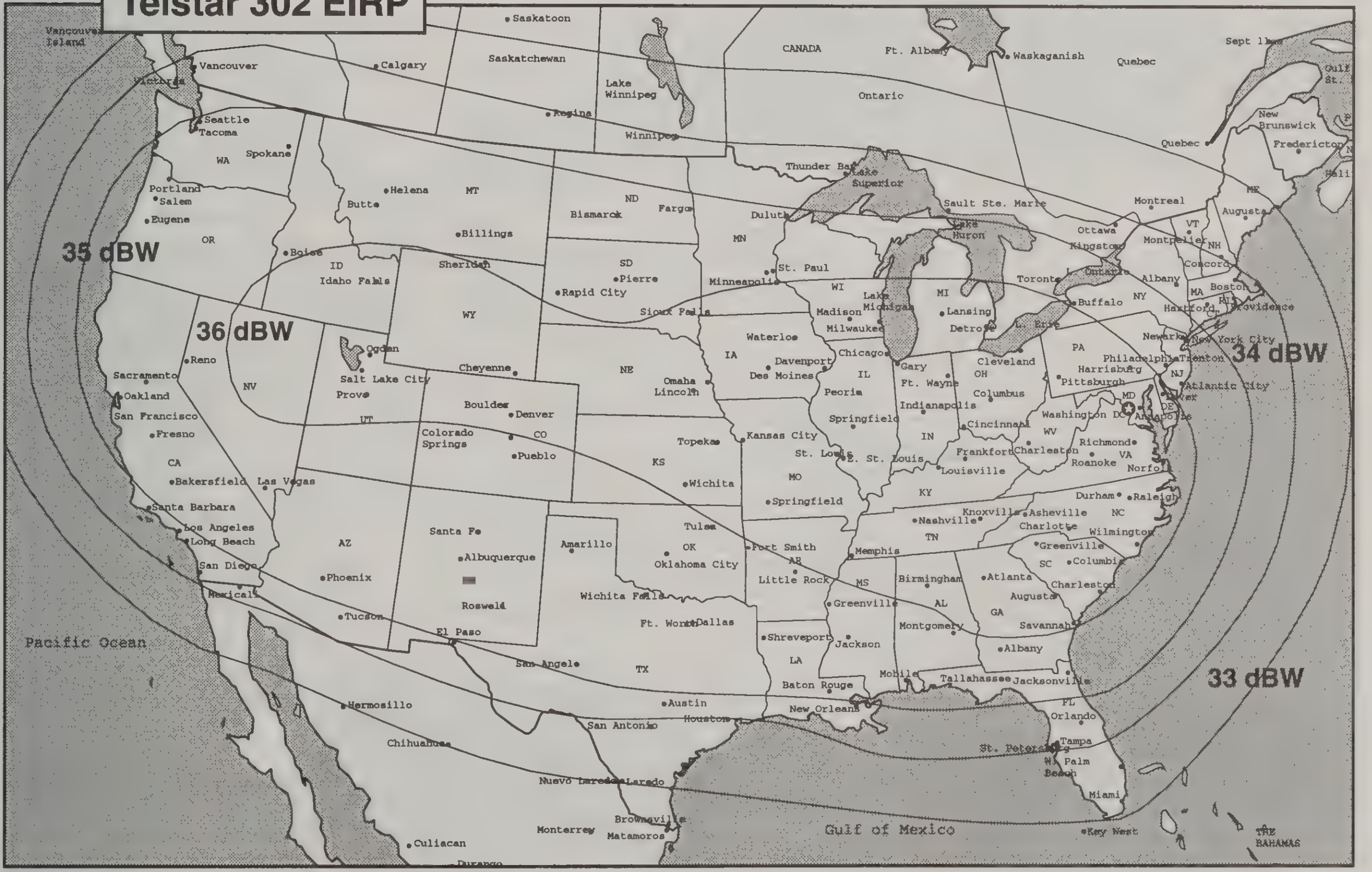
Telstar 302

Orbital location:	275ºE (85°W), inclined orbit
Launch:	August 30, 1984, Discovery 162
Expected lifetime:	10 years (exceeded)
Expected end of life:	1997

Antennas beam coverage overview:

C-band:	Conus; Alaska, Hawaii, Puerto Rico

Telstar 302 EIRP



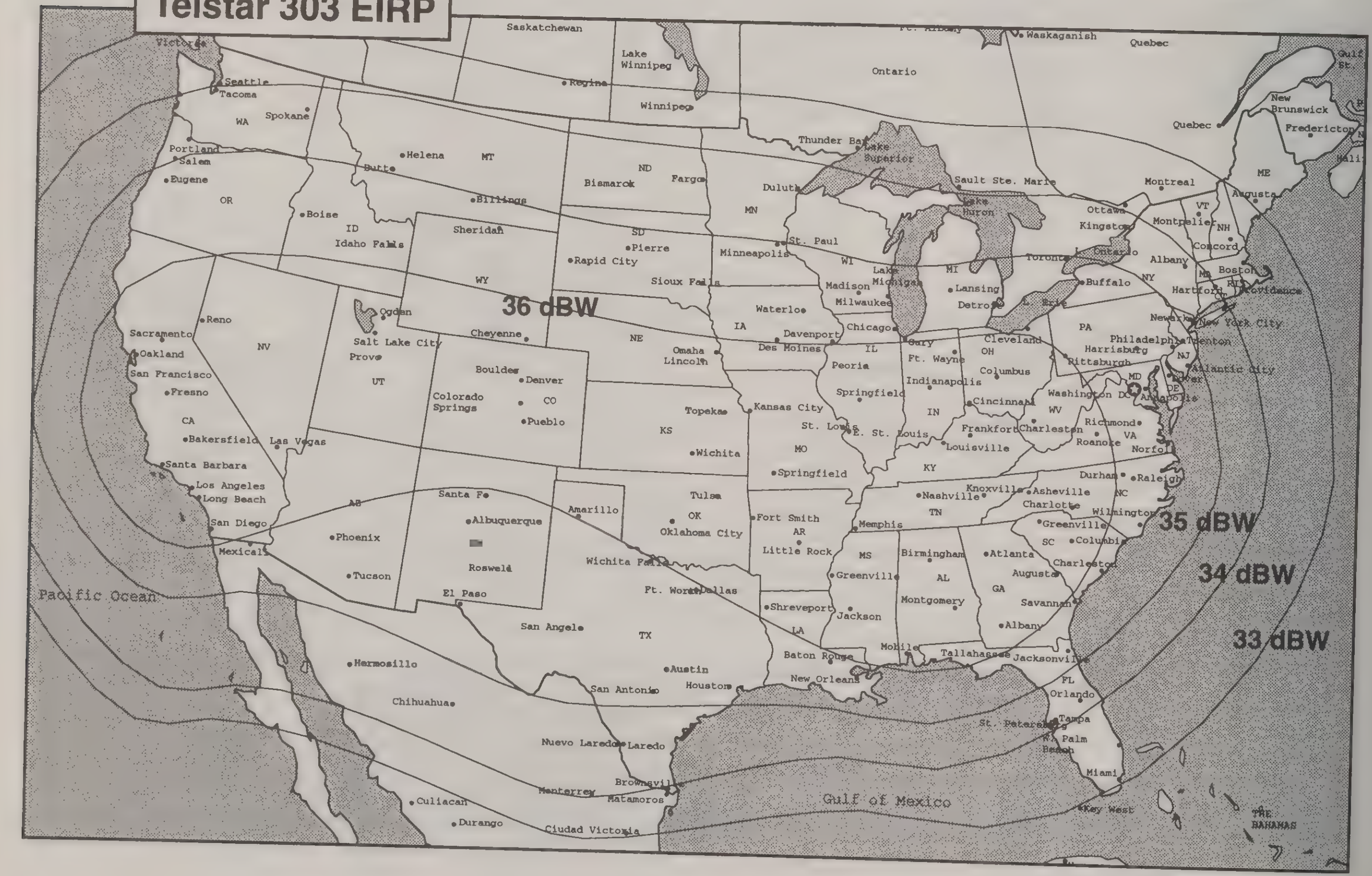
Telstar 303

Orbital location:	237°E (123°W), inclined orbit
Launch:	June 17, 1985, Discovery 192
Expected lifetime:	10 years (exceeded)
Expected end of life:	1998

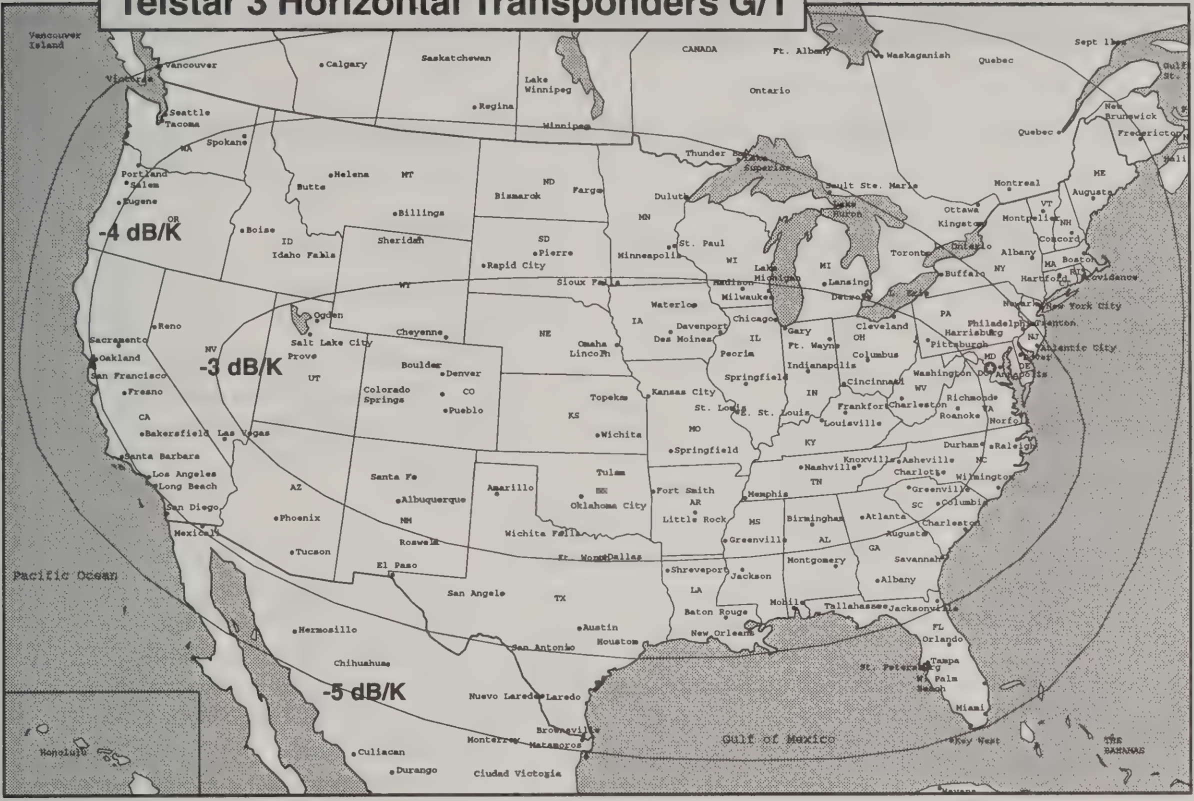
Antenna beam coverage overview:

C-band:	Conus; Puerto Rico, Alaska, Hawaii spot coverage

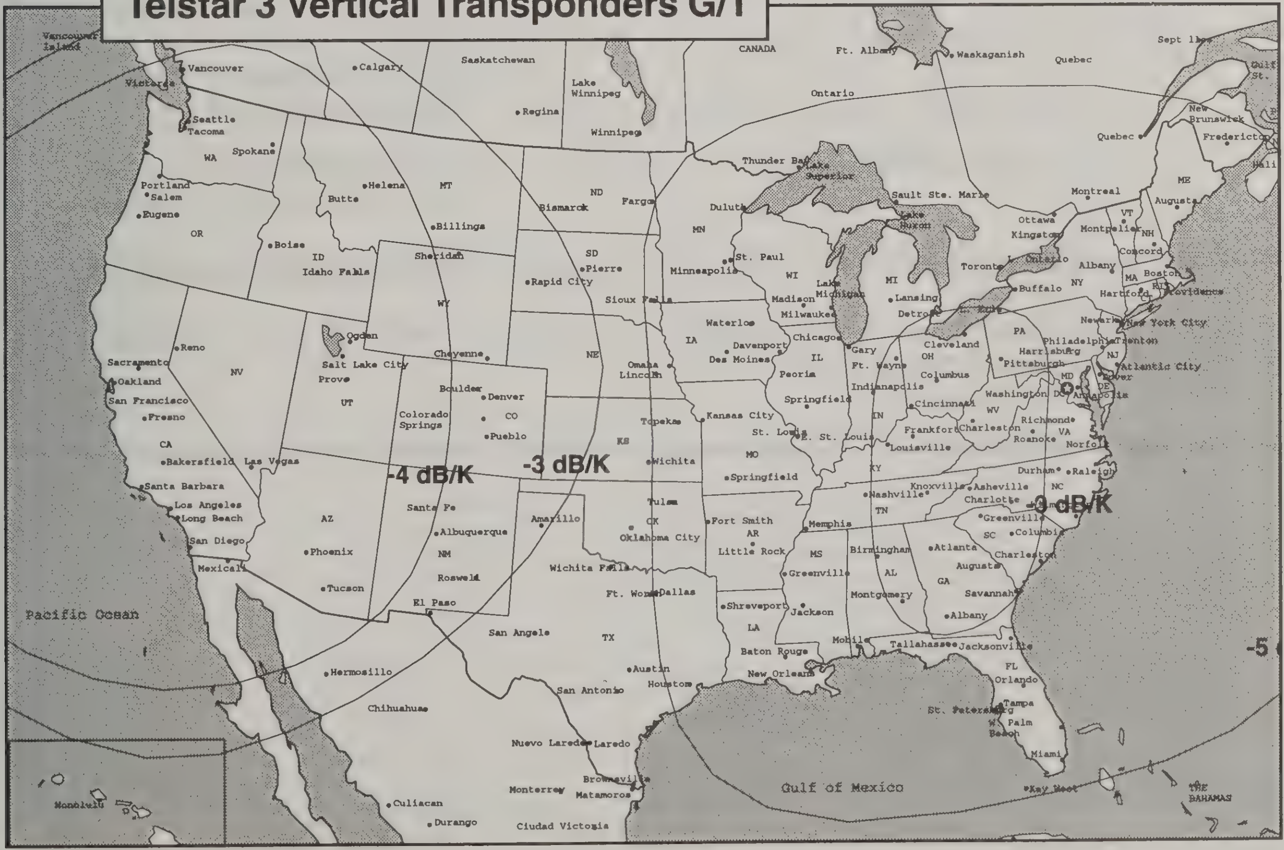
Telstar 303 EIRP



Telstar 3 Horizontal Transponders G/T



Telstar 3 Vertical Transponders G/T



TELSTAR 4 SYSTEM At A Glance

Satellite name:	Telstar 401*, 263°E (97°W); Telstar 402R, 269°E (91°W)
Spacecraft data:	
Dry mass (in orbit)	1,568 kg
Primary power (EOL):	4,800 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	December 15, 1993 (401); September 23, 1995 (402R)
Launch vehicle:	Atlas Centaur IIAS (401); Ariane 42L (402R)
Expected lifetime:	12 years
Transponders:	
Number:	24 C-band, 16 Ku-band
Power output:	12/23 W TWTA (C-band); 60/120 W TWTA (Ku-band)
Polarization:	Linear: horizontal and vertical
Redundancy:	4:2 Receivers, 7:6 SSPAs (C-band); 4:2 Receivers, 18:12 TWTAs (Ku-band);
G/T:	-3 for Conus and Hawaii, -4 for PR and VI, -6 for Alaska (C-band); -1 for Conus, Hawaii, PR, VI, -5 for Alaska (Ku-band)
Single carrier saturation flux density:	-74 to -92 dBW/sq.m. (C-band); -78 to -96 dBW/sq.m. (Ku-band)
Manufacturer:	Martin Marietta Astrospace

*Telstar 401 was declared permanently out of service on January 17, 1997. As of press time, the cause of the failure was not yet determined.

Telstar 4 Ku-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)*	Uplink(GHz)	Downlink(GHz)
1	V	54	44.3	14.030	11.730
2	H	54	44.3	14.043	11.743
3	V	54	44.3	14.090	11.790
4	H	54	44.3	14.103	11.803
5	V	54	44.3	14.150	11.850
6	H	54	44.3	14.163	11.863
7	V	54	44.3	14.210	11.910
8	H	54	44.3	14.223	11.923
9	V	54/27	44.3/44.1	14.271	11.971
10	H	54/27	44.3/44.1	14.284	11.984
11	V	54/27	44.3/44.1	14.333	12.033
12	H	54/27	44.3/44.1	14.346	12.046
13	V	54/27	44.3/44.1	14.395	12.095
14	H	54/27	44.3/44.1	14.408	12.108
15	V	54/27	44.3/44.1	14.457	12.157
16	H	54/27	44.3/44.1	14.470	12.170

* Listed EIRP is for Alaska @ 60 W is 40.3 dBW; Conus, Hawaii and Puerto Rico @ 60 W; Conus, Hawaii and Puerto Rico @ 120 W: 47.1 dBW; Alaska @ 120 W: 43.1 dBW; transponders 5 through 16.
Transponders 9 through 16 are each splittable into two 27 MHz transponders.
120 W available for lower of each pair of split transponders.

Telstar 4 C-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW) *	Uplink(GHz)	Downlink(GHz)
1	V	36	35	5.945	3.720
2	H	36	35	5.965	3.740
3	V	36	35	5.985	3.760
4	H	36	35	6.005	3.780
5	V	36	35	6.025	3.800
6	H	36	35	6.045	3.820
7	V	36	35	6.065	3.840
8	H	36	35	6.085	3.860
9	V	36	35	6.105	3.880
10	H	36	35	6.125	3.900
11	V	36	35	6.145	3.920
12	H	36	35	6.165	3.940
13	V	36	35	6.185	3.960
14	H	36	35	6.205	3.980
15	V	36	35	6.225	4.000
16	H	36	35	6.245	4.020
17	V	36	35	6.265	4.040
18	H	36	35	6.285	4.060
19	V	36	35	6.305	4.080
20	H	36	35	6.325	4.100
21	V	36	35	6.345	4.120
22	H	36	35	6.365	4.140
23	V	36	35	6.385	4.160
24	H	36	35	6.405	4.180

* Conus @ 12 W; Alaska and Puerto Rico @ 12 W: 31 dBW; Hawaii @ 12 W: 33 dBW
Conus @ 23 W: 37.8 dBW; Alaska and Puerto Rico @ 23 W: 33.8 dBW;
Hawaii @ 23 W: 35.8 dBW

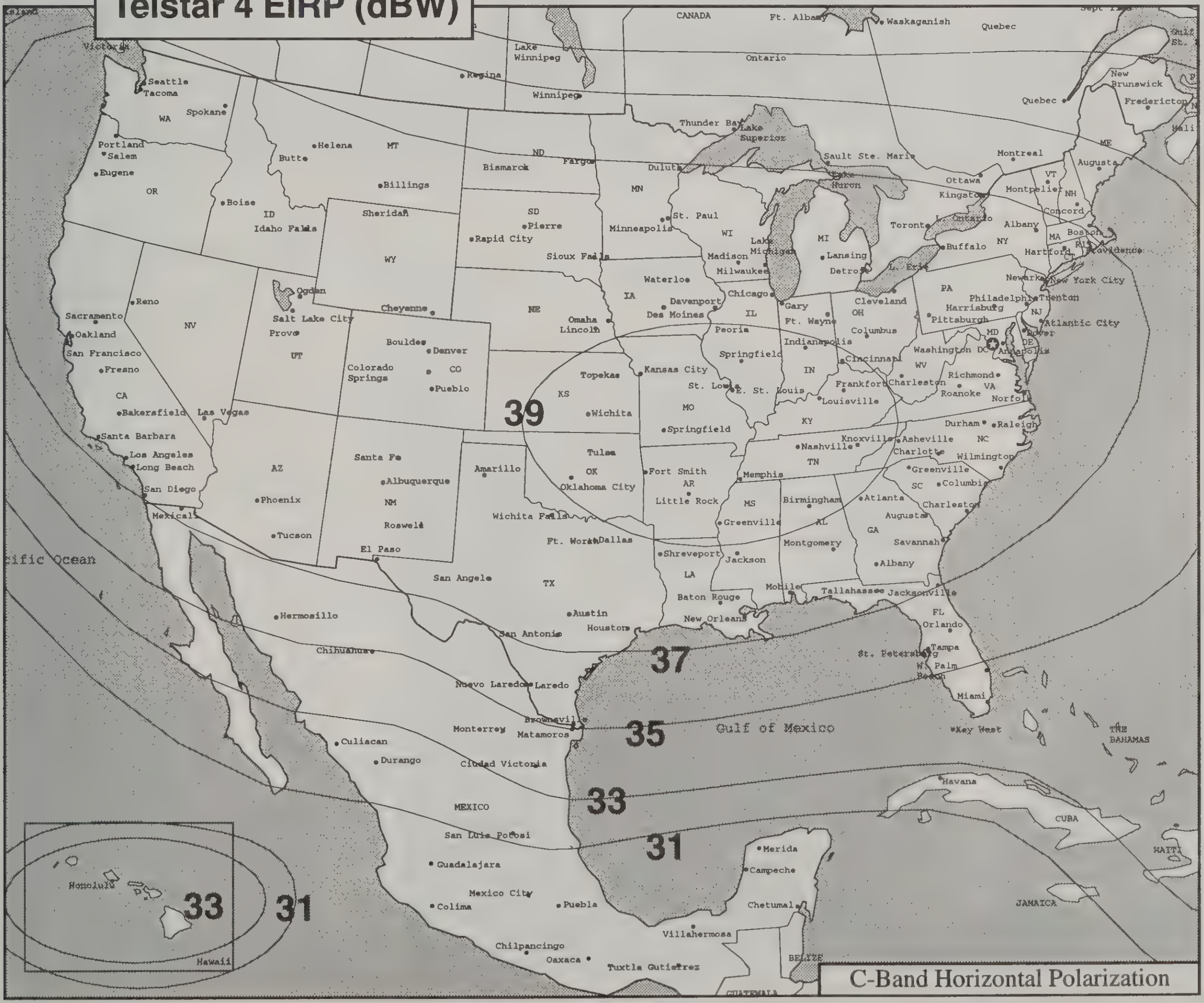
Telstar 4

Orbital location:	263ºE (97°W) [401], 269°E (91°W) [402R]
Launch:	December 15, 1993, Atlas Centaur IIAS (401); September 23, 1995, Ariane 42L (402R)
Expected lifetime:	12 years
Expected end of life:	2005 (401), 2007 (402R)

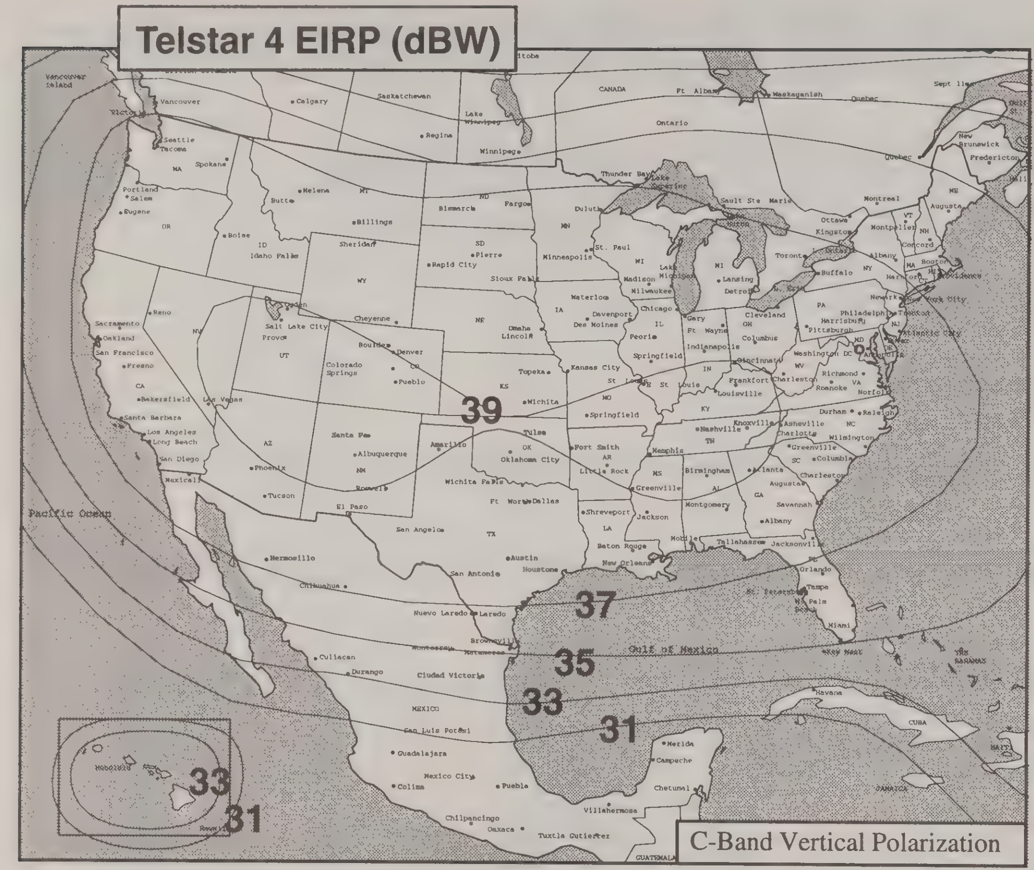
Antennas beam coverage overview:

C-band, Ku-band:	Conus; Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands

Telstar 4 EIRP (dBW)

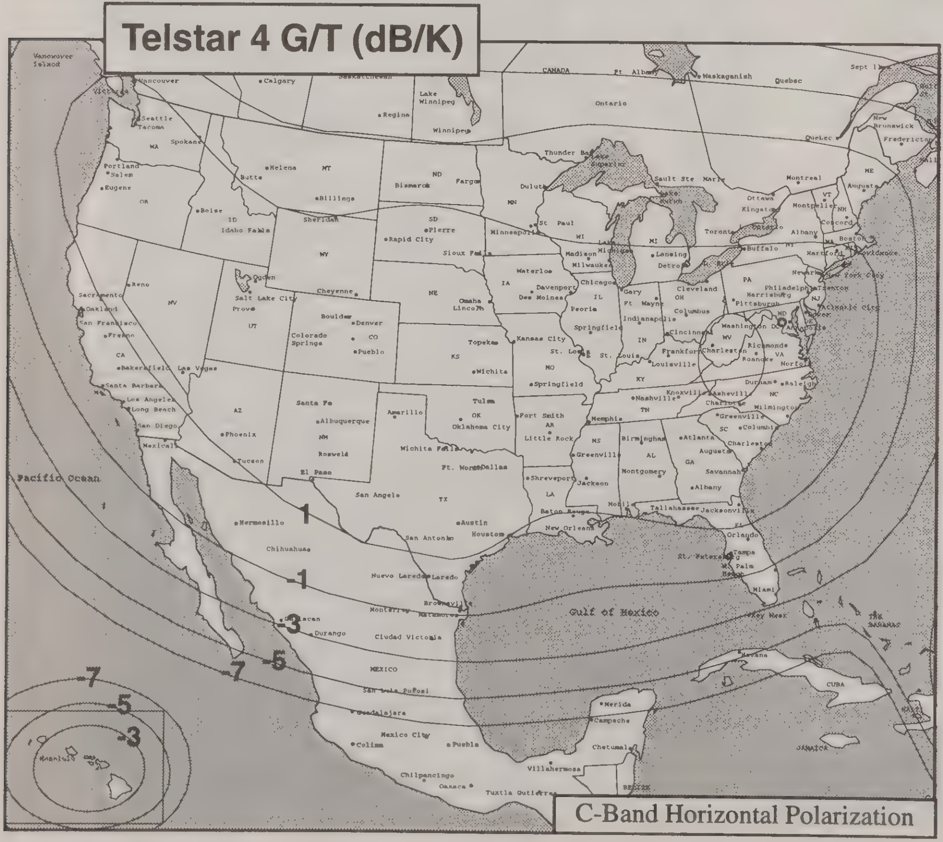


C-Band Horizontal Polarization



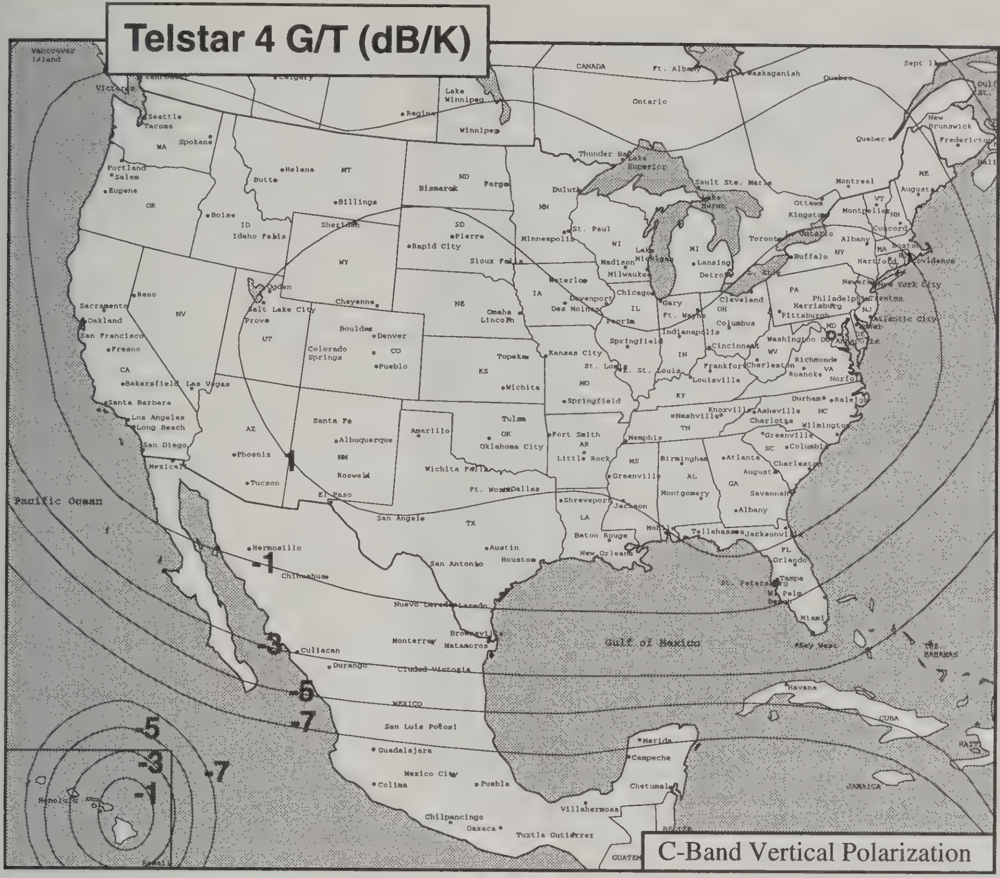
Telstar 4 EIRP (dBW)

C-Band Vertical Polarization



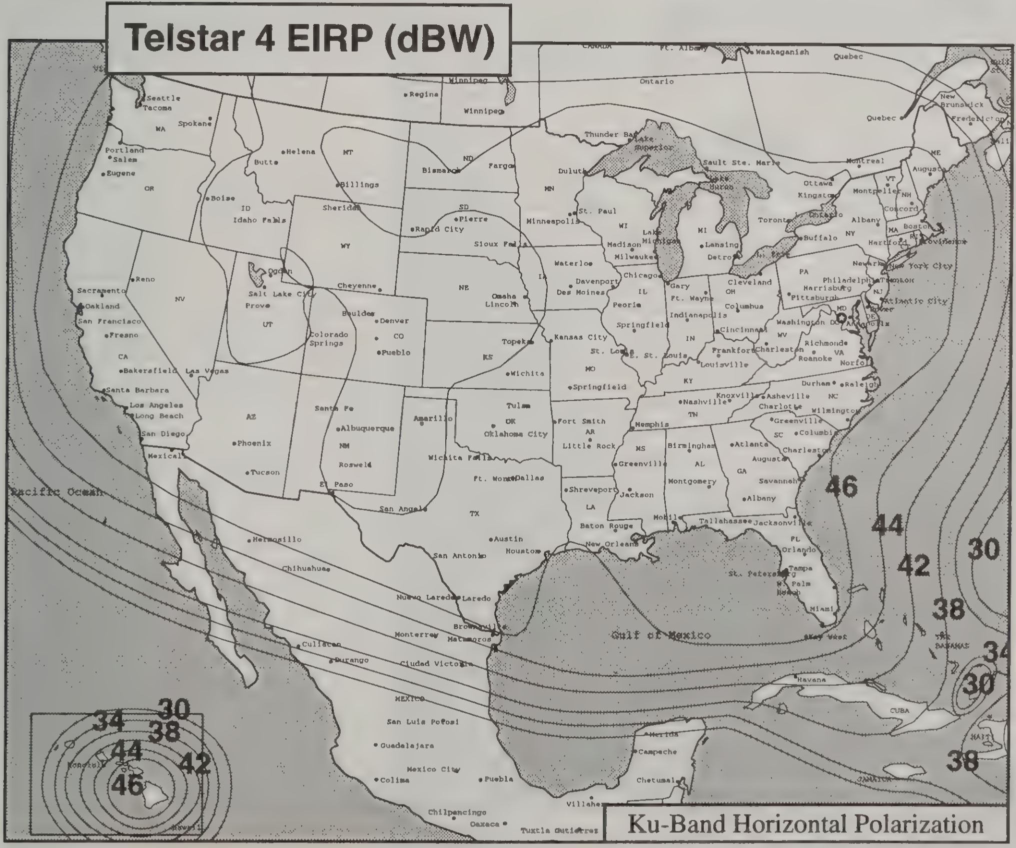
Telstar 4 G/T (dB/K)

C-Band Horizontal Polarization



Telstar 4 G/T (dB/K)

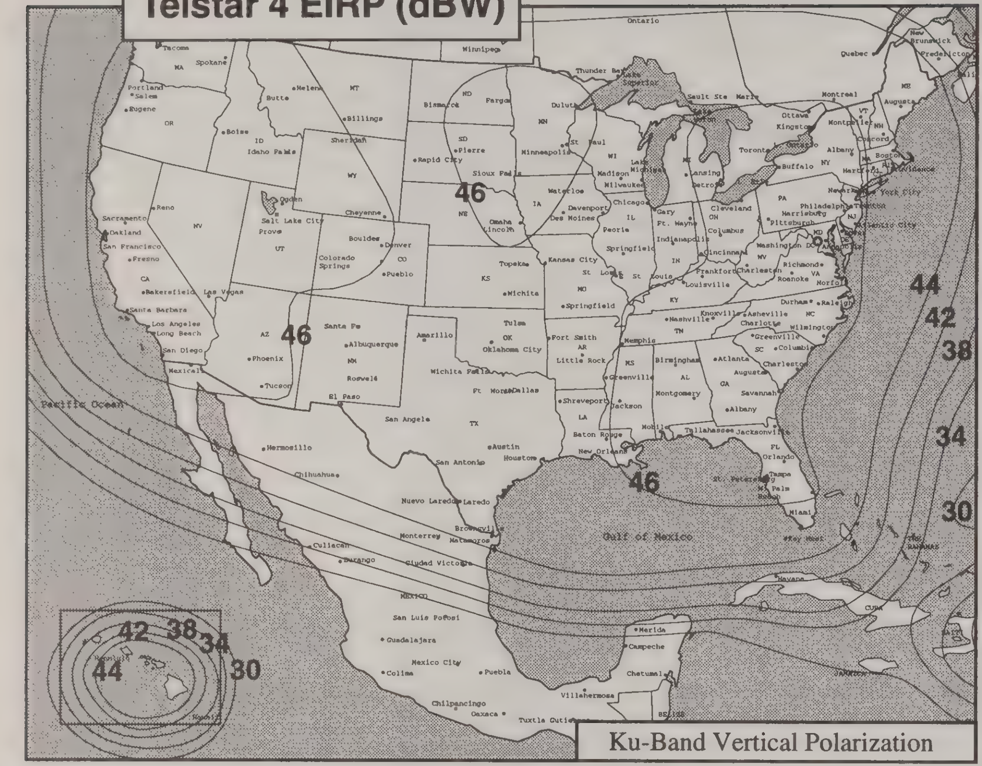
C-Band Vertical Polarization



Telstar 4 EIRP (dBW)

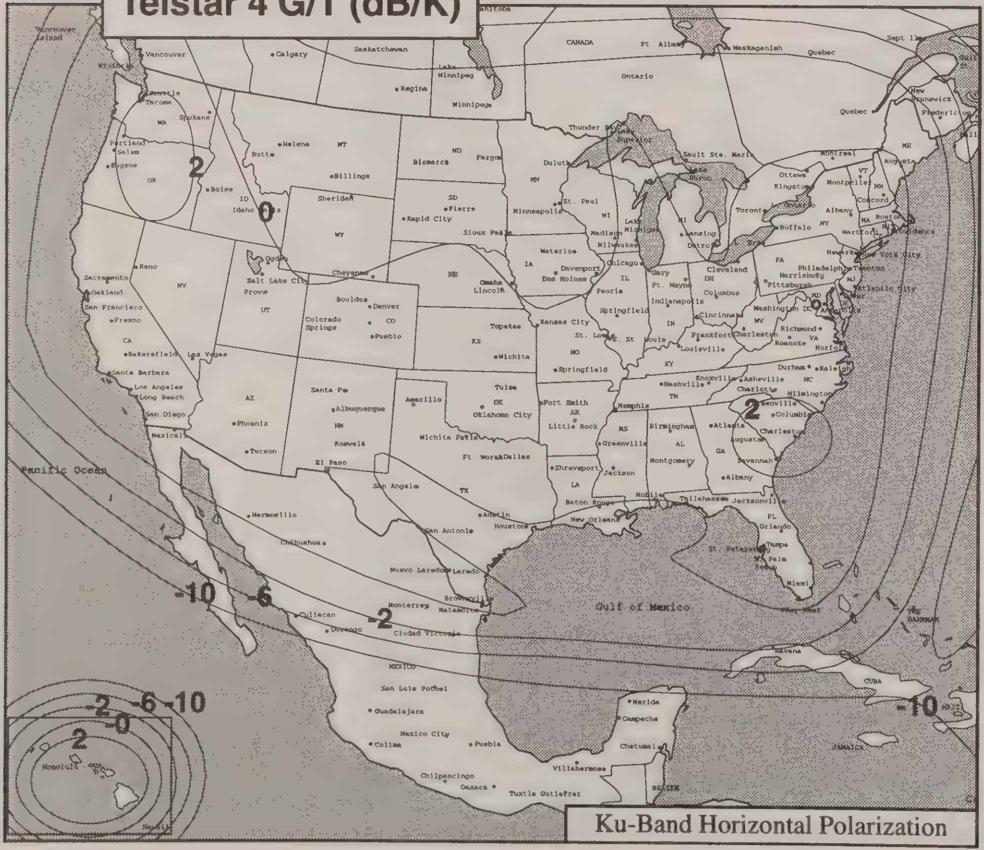
Ku-Band Horizontal Polarization

Telstar 4 EIRP (dBW)

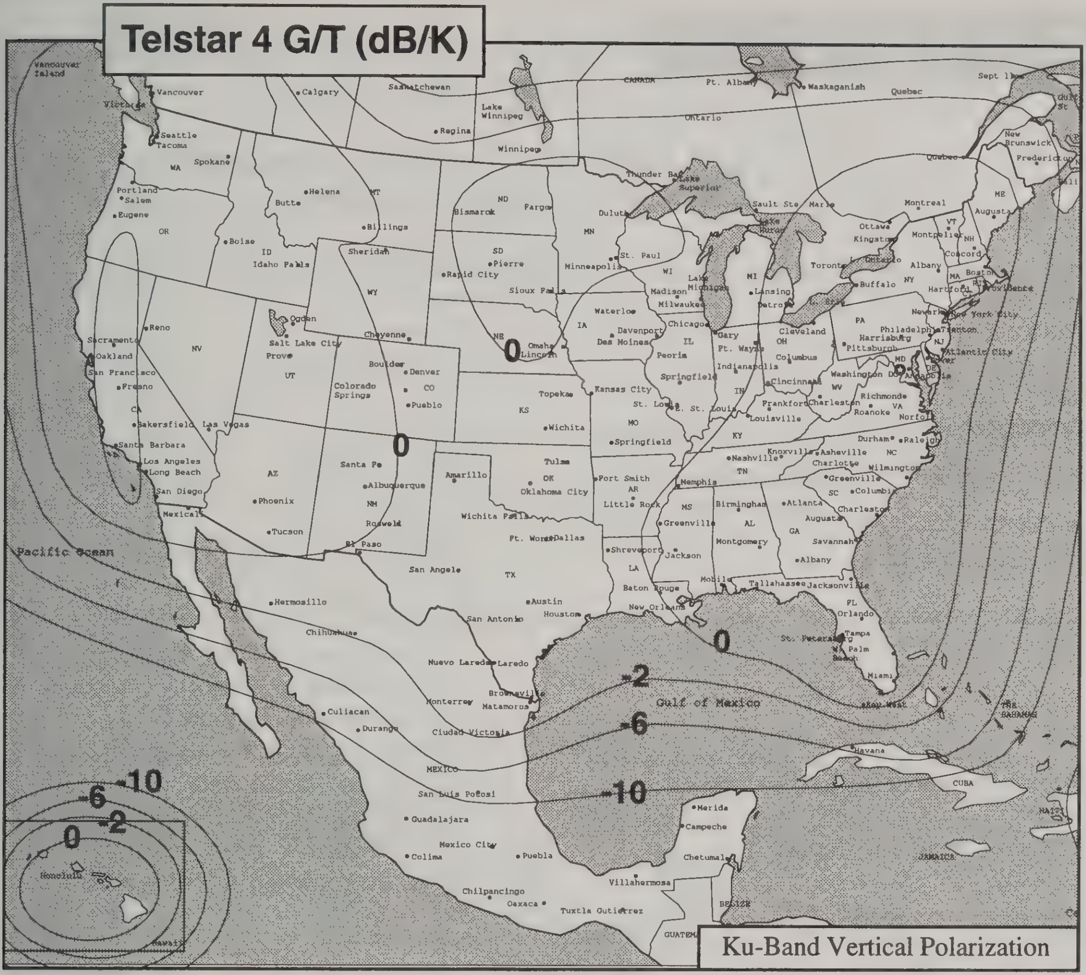


Ku-Band Vertical Polarization

Telstar 4 G/T (dB/K)



Ku-Band Horizontal Polarization



Telstar 4 G/T (dB/K)

Ku-Band Vertical Polarization

TELSTAR 5 SYSTEM At A Glance

Satellite name:	Telstar 5*, 267°E (93°W) [to be launched]
Spacecraft data:	
Launch date:	July 1997
Launch vehicle:	Proton
Expected lifetime:	12 years
Transponders:	
Number:	24 (C-band); 4 @ 54 MHz and 24 @ 27 MHz (Ku-band)
Polarization:	Orthogonal linear
G/T:	-1.8 for Conus, -7.7 for Alaska, -6.7 for Hawaii, -5.0 for PR, VI (C-band); -0.8 for Conus, -7.3 for Alaska, -1.3 for Hawaii, PR, VI, -6.3 for Mexico, southern Canada, Caribbean (Ku-band)
Frequency band:	4/6 GHz and 12/14 GHz
Single carrier saturation flux density:	-71 to -92 dBW/sq.m. (C-band); -75 to -96 dBW/sq.m. (Ku-band)
Manufacturer:	Space Systems/Loral

*Orbital location subject to FCC approval

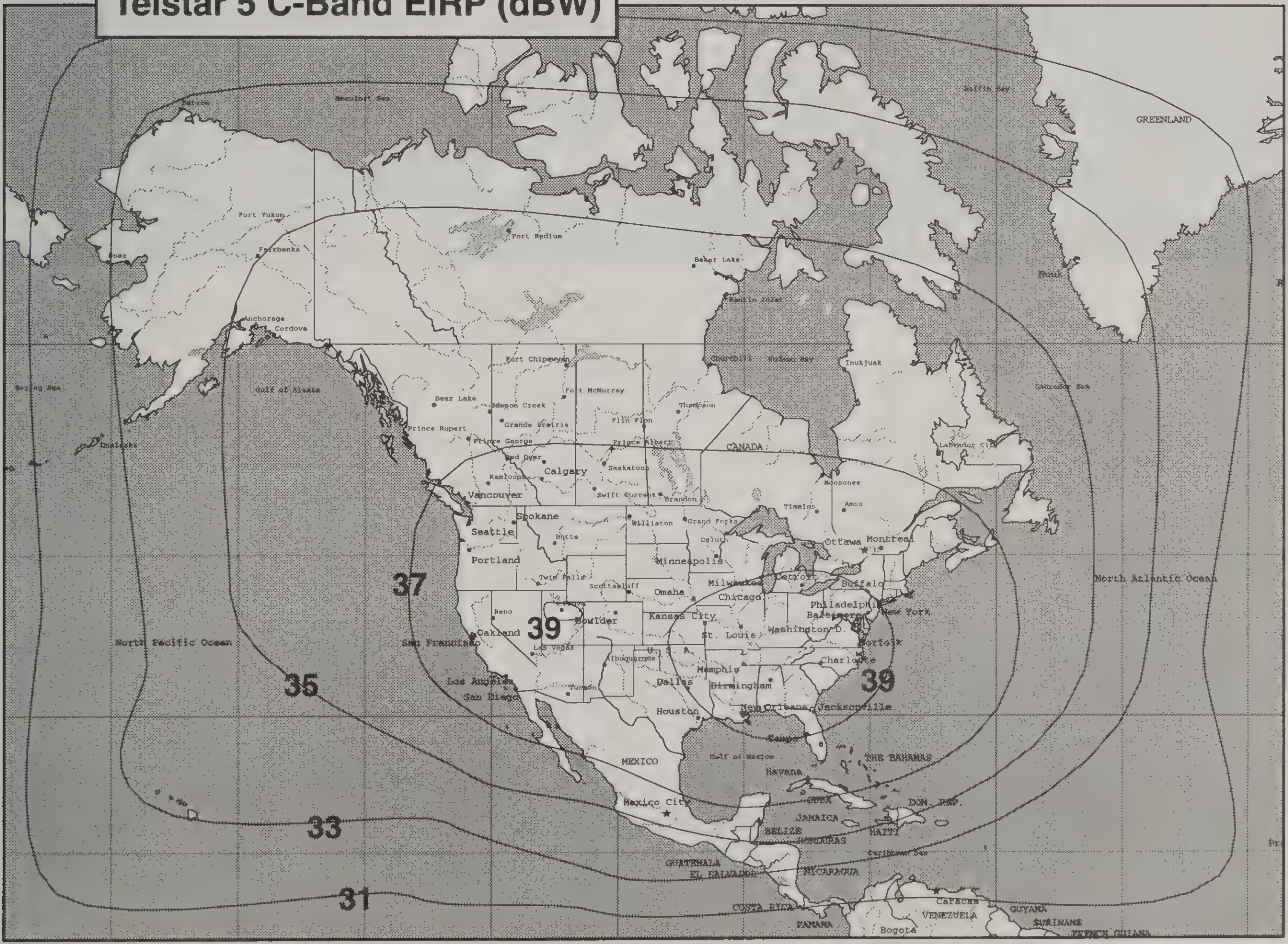
Telstar 5

Orbital location:	267ºE (93°W), to be launched
Launch:	July 1997, Proton
Expected lifetime:	12 years
Expected end of life:	2009

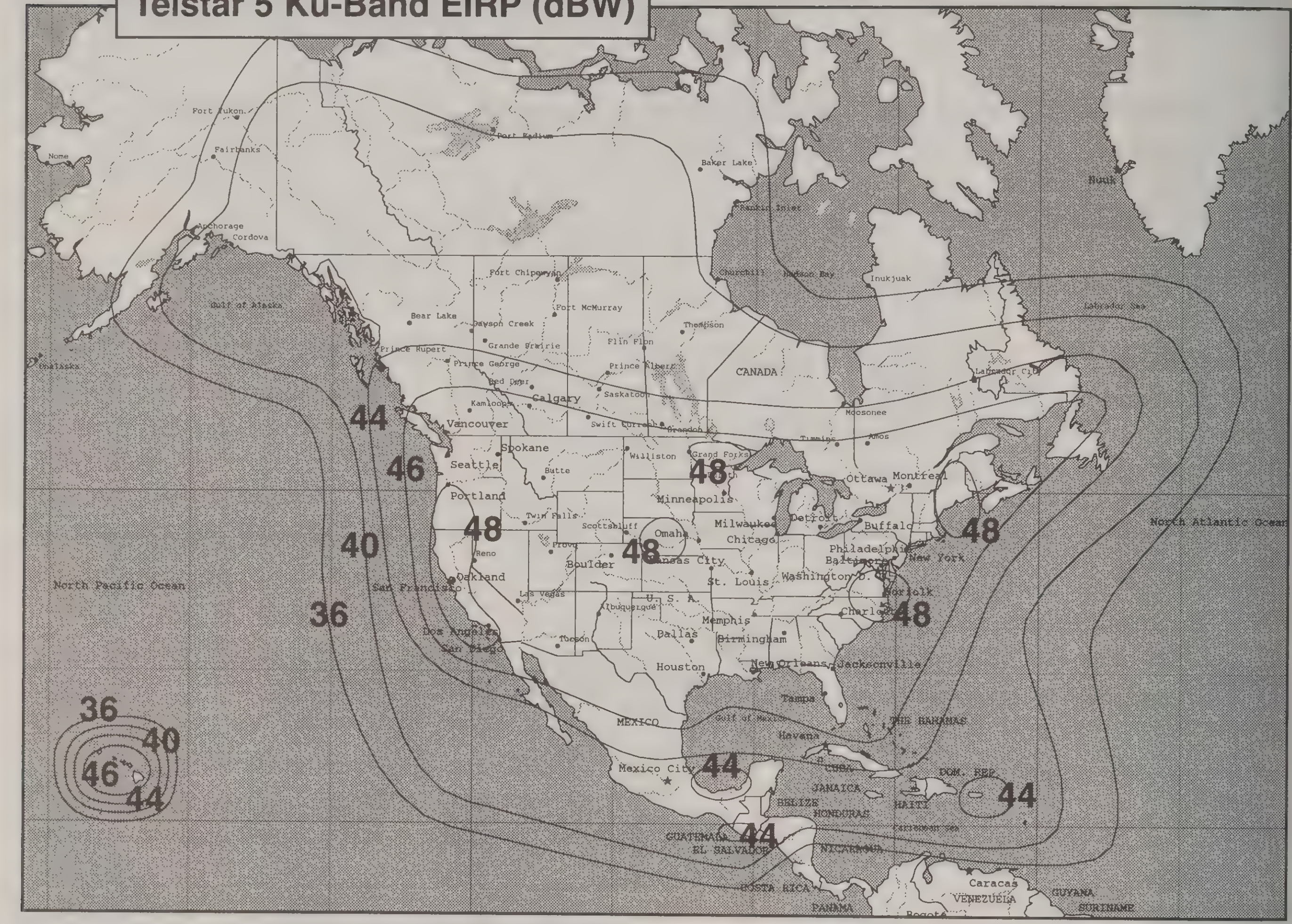
Antennas beam coverage overview:

C-band:	Conus, Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands
Ku-band:	Conus, Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands, Mexico, southern Canada, Caribbean

Telstar 5 C-Band EIRP (dBW)



Telstar 5 Ku-Band EIRP (dBW)



TELSTAR 6 SYSTEM At A Glance

Satellite name:	Telstar 6 (TBA) [to be launched]
Spacecraft data:	
Launch date:	1997
Manufacturer:	Space Systems/Loral

TELSTAR 7 SYSTEM At A Glance

Satellite name:	Telstar 7 (TBA) [to be launched]
Spacecraft data:	
Launch date:	1997
Manufacturer:	Space Systems/Loral

NASA LEWIS RESEARCH CENTER

MS 54-6
21000 Brookpark Road
Cleveland, OH 44135
USA

Telephone: (216)433-2901
Web Site Address: kronos.lerc.nasa.gov/acts/acts.html

Contacts:

Sina Javidi, Project Manager
Jon Michael Smith, ACTS Program Manager, (202)358-1982

Overview:

The Advanced Communications Technology Satellite was launched from the Kennedy Space Center aboard the Space Shuttle Discovery on September 12, 1993.

Services Offered:

- Operating in the Ka-band (30/20 GHz) where there is 2.5 GHz of spectrum available (five times that available at lower frequency bands)
- Very high-gain, multiple hopping beam antenna systems which permit smaller aperture Earth stations
- On-board baseband switching which permits interconnectivity between users at an individual circuit level
- A microwave switch matrix which enable gigabit per second communication between users

ACTS SYSTEM At A Glance

Satellite name:	ACTS, 260°E (100°W)
Spacecraft data:	
Stabilization:	3-axis
Launch date:	September 12, 1993
Launch vehicle:	STS/TOS
Expected lifetime:	4 years
Transponders:	
Band:	Ka-band

TEMPO SATELLITE INC.

4100 East Dry Creek Road
Littleton, CO 80122
USA

Telephone:	(303)486-3800
Facsimile:	(303)486-3890

Contact:

David P. Beddow, Vice President

Overview:

The FCC has granted Tempo 11 frequencies at 241°E (119°W) and 11 at 194°E (166°W). Tempo launched its first satellite on March 8, 1997. The satellites are Space Systems/Loral FS 1300 spacecraft, each with 16, 214 watt transponders.

Services Offered:

- Tempo leases all of its transponder capacity to Primestar Partners, LP

TEMPO SYSTEM At A Glance

Satellite name:	Tempo 1, 241°E (119°W); Tempo 2, 241°E (119°W) [to be launched]
Spacecraft data:	
Launch date:	March 8, 1997 (1), Summer 1997 (2)
Launch vehicle:	Proton (1), Atlas (2)
Transponders:	
Number:	16
Power output:	214 W TWTA
Manufacturer:	Space Systems/Loral

SECTION 2

OPERATIONAL NON-GEOSTATIONARY SYSTEMS

Included in This Section:

This section contains existing and follow-on domestic commercial communications satellite systems in orbits other than the Clarke orbit. Operators included in this section are:

1. Ministry for Postal Services and Telecommunications (Russia) 292
2. Ministry of Defense (Russia) 294
3. Air Force Space Command 296
4. GE Starsys 298
5. Orbcomm Global L.P. 300

How to Use This Section:

Profiles are organized alphabetically by country, then by operator name.

MINISTRY FOR POSTAL SERVICES AND TELECOMMUNICATIONS (RUSSIA)

7 Tverskaya Street		Telephone:	+7 095-9255108
103375 Moscow		Facsimile:	+7 095-2302097
RUSSIA		Telex:	412961 or 411120

Contact:

Aleksandr E. Krupnov, Director of International Cooperation Department

Overview:

Operates the Molniya domestic satellite system, first launched in 1965. Its orbital inclination allows coverage of all parts of the Commonwealth of Independent States including the far northern region inside the Arctic Circle, coverage not possible with geostationary satellites.

Services Offered:

- Molniya 1: government telecommunications
- Molniya 3: TV distribution and telephony

Satellite Control Network:

Satellite control:	Moscow

MOLNIYA SYSTEM At A Glance

Satellite name: Molniya 1 and Molniya 3
Spacecraft data:
  Mass (in orbit): 1,500 kg
  Eclipse protection: All transponders
  Primary power: 1,000 W (Molniya 3)
  Stabilization: 3-axis
  Launch date: March 1992 (Molniya 1-83);
    August 1992 (Molniya 1-84);
    January 1993 (Molniya 1-85);
    December 1994 (Molniya 1-88);
    October 1992 (Molniya 3-42);
    December 1992 (Molniya 3-43)
  Expected lifetime: 5 years

  Orbital parameters:
    Orbit: 400 x 40,000 km
    Inclination: 63-65°
    Orbital period: Just under 12 hours

  Spectrum usage:
    Number of transponders: 2
    Uplink: 1.0 GHz (Molniya 1); 6 GHz (Molniya 3);
    Downlink: 0.8 GHz (Molniya 1); 4 GHz (Molinya 3)
    Bandwidth (Molniya 3): 50 MHz
    EIRP (Molniya 3): 35 dBW

  Manufacturer: NPO-PM

MINISTRY OF DEFENSE (RUSSIA)

Moscow
RUSSIA

Overview:

The Glonass system is a space-based radio positioning system which provides suitably equipped users with highly accurate position, velocity and time data. Receivers operate passively, thus allowing an unlimited number of simultaneous users. Receivers are available with dual Glonass/GPS compatibility.

Satellite Control Network:

Satellite control:	Moscow St. Petersburg Ternopol Eniseisk Komsomolsk

GLONASS SYSTEM At A Glance

Satellite name: .... Glonass 44 - 61

Spacecraft data:
- Eclipse protection: .... Yes
- Launch date: .... May 1988 - February 1993
- Expected lifetime: .... 2 years

Orbital parameters:
- Altitude: .... 19,100 km
- Inclination: .... 64.8°
- Period: .... 11hr., 15.5 min

Transponders:
- Frequency bands: .... 1602.56 - 1615.50 MHz
- EIRP: .... 24-27 dBW
- Polarization: .... RHCP

Manufacturer: .... NPO-PM/NIIKP

AIR FORCE SPACE COMMAND

2 SOPS/DOUAN		Telephone:	(719)567-6378
Falcon Air Force Base, CO 80912-3041		Facsimile:	(719)567-6307
USA		Corporate E-mail:	gps@fafb.af.mil

Overview:

The Navstar global positioning system (GPS) is a space-based radio positioning system which provides suitably equipped users with highly accurate velocity, position and time data. GPS receivers operate passively, thus allowing an unlimited number of simultaneous users. The nominal constellation consists of 24 satellites in 6 planes of 10,900 nautical mile semi-geosynchronous circular orbits.

Services Offered:

- Worldwide, all-weather, 3-dimensional coverage 24 hours per day. Two levels of service are provided:
  1) Standard positioning service (SPS): guarantees an accuracy of 100 meters for horizontal position, and timing accuracy to 340 ns (velocity of 10 m/s).
  2) Precise positioning service: for authorized users only. Guarantees an accuracy of 16 meters spherical error probable (SEP), or 3D, and timing of 90 ns (velocity of .1 m/s).
- Possesses capability to degrade coverage for unauthorized users and prevent spoofing of transmitted signal.

NAVSTAR SYSTEM At A Glance

- Satellite name: SVN 13 - 29, 31 - 37, 39
- Spacecraft data:
  - Mass (in orbit): 1,055 kg
  - Primary power (EOL): 450 W
  - Stabilization: 3-axis reaction wheel stabilized, thruster back-up
  - Launch date: June 1989 - March 1994; August 30, 1993 (35); March 27, 1996 (33)
  - Expected lifetime: 7.5 years

  - Orbital parameters:
    - Number of satellites: 24
    - Altitude: 10,900 nautical miles
    - Inclination: 55°
    - Period: 12 hours

  - Transmitters:
    - Power output: 50 W TWTA (L1); 8W (L2)
    - Polarization: RHCP

  - Manufacturer: Rockwell International, GPS Block II, Block IIa

GE STARSYS

1750 Old Meadow Drive
McLean, VA 22102
USA

Telephone: (703)848-1224
Facsimile: (703)848-1058

Contacts:

Yousef Javadi, President
Alan Renshaw, Manager of Government Affairs

Overview:

This satellite system provides ultra low-cost two-way communications, positioning determination capabilities.

Services Offered:

- Two-way messaging from a $75 to $200 calculator-size user terminal
- Positioning determination anywhere in the world
- Theft control for automobiles, construction equipment and personal property
- Remote monitoring and reporting for vehicle fleets, domestic utilities and building security
- Cargo tracking and monitoring
- Emergency services for vehicle breakdowns and remote area emergencies
- Applications for military operations
- Interconnection with the PSTN
- Environmental monitoring services
- Bio-sensor monitoring for tele-medicine applications

Satellite Control Network:

TT&C stations:	Maryland

STARSYS SYSTEM At A Glance

Satellite name: Starsys

Spacecraft data:

- Mass(in orbit): 150 kg
- Stabilization: Gravity gradient
- Launch date: 1997
- Expected lifetime: 5 years

Orbital parameters:

- Number of satellites: 24
- Altitude: 1,300 km
- Inclination: 60°
- Orbital period: 111.5 minutes

Spectrum usage:

- Uplink: 148 - 149 MHz (return links); 149 - 150 MHz (forward links)
- Downlink: 137 - 138 MHz (return links); 400.15 - 401 MHz (forward links)
- Multiple access method: Hybrid FDMA/SSMA

Single carrier saturation flux density: -152 dBW/sq.m.

Manufacturer: Alcatel Telecom

ORBCOMM GLOBAL L.P.

21700 Atlantic Boulevard
Dulles, VA 20166
USA

Telephone:	(703)406-6000
Facsimile:	(703)406-3504
Corporate E-mail:	aparker@orbcomm.net
Web Site Address:	www.orbcomm.net

Contacts:

Alan L. Parker, President and Chief Executive Officer
Bartlett Snell, Senior Vice President, Finance & Administration/Chief Financial Officer
Robert Pizzimenti, Executive Vice President, Marketing and Business Development
Andre Halley, Managing Director, International Business Development
Paul Locke, Vice President, Engineering and Operations (Acting)
Mary Ellen Seravalli, Vice President and General Council

Overview:

Orbcomm is a two-way global wireless communications system offering packet switched data, messaging, monitoring and geopositioning services. With a full constellation of satellites, Orbcomm provides seamless global coverage utilizing low cost, personal portable communicators. The first two Orbcomm satellites were launched on April 3, 1995. Up to 36 satellites are scheduled with launches in 1997 and 1998.

Services Offered:

- Two-way remote monitoring and control of fixed and mobile sites
- Emergency communications
- Full featured two-way messaging utilizing alphanumeric handheld subscriber communicators

Satellite Control Network:

Satellite control:	Dulles, VA

ORBCOMM SYSTEM At A Glance

Satellite name: Orbcomm

Spacecraft data:
- Mass (in orbit): 43 kg
- Primary power (EOL): 200 W
- Eclipse protection: 50%
- Polarization: Circular
- Stabilization: Gravity gradient/3-axis
- Launch date: April 3, 1995
- Launch vehicle: Pegasus XL
- Expected lifetime: 5 years

Orbital parameters:
- Number of satellites: 36
- Altitude: 775 km
- Inclination: Orbit 1 - 70° (2); Orbit 2 - 45° (8); Orbit 3 - 45° (8); Orbit 4 - 45° (8); Orbit 5 - 45° (8); Orbit 6 - 70° (2)
- Orbital period: 100 minutes
- Eccentricity: ~.001

Spectrum usage:
- Uplink: 148 - 150.05 MHz
- Downlink: 137 - 138 MHz
- Multiple access method: FDMA/TDMA

Baseband processor: Motorola 6800
Data transaction: 2400 bps inbound, 4800/9600 bps outbound

Manufacturer: Orbital Sciences Corporation

SECTION 3

PLANNED GEOSTATIONARY SYSTEMS

Included in This Section:

This section contains planned satellite systems in the geosynchronous orbit. This includes only planned systems which have no current operational satellites; planned follow-on satellites of existing systems will be found in Section 1. Operators included in this section are:

1. China Orient Telecomm. Satellite Company Ltd. 304
2. Sinosat Communications Company 310
3. Asia Cellular Satellite (ACeS) 312
4. P.T. Mediacitra Indostar 316
5. Pasifik Satelit Nusantara (PSN) 318
6. Mabuhay Philippines Satellite Corporation 320
7. Gascom 324
8. Ministry of Post, Telegraph and Telephone (Saudi Arabia) 326
9. Singapore Telecommunications Ltd. 328
10. CD Radio Inc. 333
11. Directsat Corporation 336
12. Dominion Video Satellite Inc. 338
13. Loral Space & Communications Inc. 340
14. Worldspace Inc. 342

How to Use This Section:

Satellite operators are arranged alphabetically by country, then by operator name within each country.

CHINA ORIENT TELECOMM. SATELLITE COMPANY LTD.

7/F Hui Tian Hotel, #61C Ande Road
East City District
Beijing, P.R. 100011
CHINA

Telephone: +86 10-4242373
Facsimile: +86 10-4242366

Booking Contact:

Mr. Cheng Zhengjun, Manager of Planning and Business Development

Contacts:

Mr. Li Changan, Chairman of the Board
Mr. Hao Weimin, Vice Chairman of the Board and President

Overview:

ChinaStar-1 is scheduled to be launched in late 1997 on board a Long March 3B launch vehicle.

CHINASTAR SYSTEM At A Glance

Satellite name:	ChinaStar-1, 87.5°E
Spacecraft data:	
Area of coverage:	China, South Asia, West, Central, East and Southeast Asia
Mass (dry weight):	1,418 kg
Primary power:	7,665 W (spring equinox BOL), 6,940 W (autumn equinox EOL)
Stabilization:	3-axis
Launch date:	Late 1997
Launch vehicle:	Long March 3B
Expected lifetime:	15 years
Transponders:	
Number:	18 C-band, 20 Ku-band
Bandwidth:	12 @ 36 MHz, 6 @ 72 MHz (C-band); 16 @ 36 MHz, 4 @ 72 MHz (Ku-band)
Redundancy:	12 for 9 (2 group) TWTAs, 4 for 2 receivers (C-band); 11 for 8 (2 group) TWTAs @ 36 MHz, 3 for 2 (2 group) TWTAs @ 72 MHz, 4 for 2 receivers (Ku-band)
G/T:	+1 dB/K (C-band); +5 dB/K (Ku-band)
Single carrier saturation flux density:	-75 to -97 dBW/m² (C-band); -70 to -92 dBW/m² (Ku-band)
Manufacturer:	Lockheed Martin

ChinaStar-1 C-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1A	V	36	41	5.945	3.720
1B	H	36	41	5.965	3.740
2A	V	36	41	5.985	3.760
2B	H	36	41	6.005	3.780
3A	V	36	41	6.025	3.800
3B	H	36	41	6.045	3.820
4A	V	36	41	6.065	3.840
4B	H	36	41	6.085	3.860
5A	V	36	41	6.105	3.880
5B	H	36	41	6.125	3.900
6A	V	36	41	6.145	3.920
6B	H	36	41	6.165	3.940
7A	V	36	41	6.205	3.980
7B	H	36	41	6.225	4.000
8A	V	36	41	6.285	4.060
8B	H	36	41	6.305	4.080
9A	V	36	41	6.365	4.140
9B	H	36	41	6.385	4.160

ChinaStar-1 Ku-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
10A	V	36	52	14.038	12.290
10B	H	36	52	14.058	12.310
11A	V	36	52	14.118	12.370
11B	H	36	52	14.138	12.390
12A	V	36	52	14.178	12.430
12B	H	36	52	14.198	12.450
13A	V	36	52	14.218	12.470
13B	H	36	52	14.238	12.490
14A	V	36	52	14.258	12.510
14B	H	36	52	14.278	12.530
15A	V	36	52	14.298	12.550
15B	H	36	52	14.318	12.570
16A	V	36	52	14.338	12.590
16B	H	36	52	14.358	12.610
17A	V	36	52	14.378	12.630
17B	H	36	52	14.398	12.650
18A	V	36	52	14.418	12.670
18B	H	36	52	14.438	12.690
19A	V	36	52	14.458	12.710
19B	H	36	52	14.478	12.730

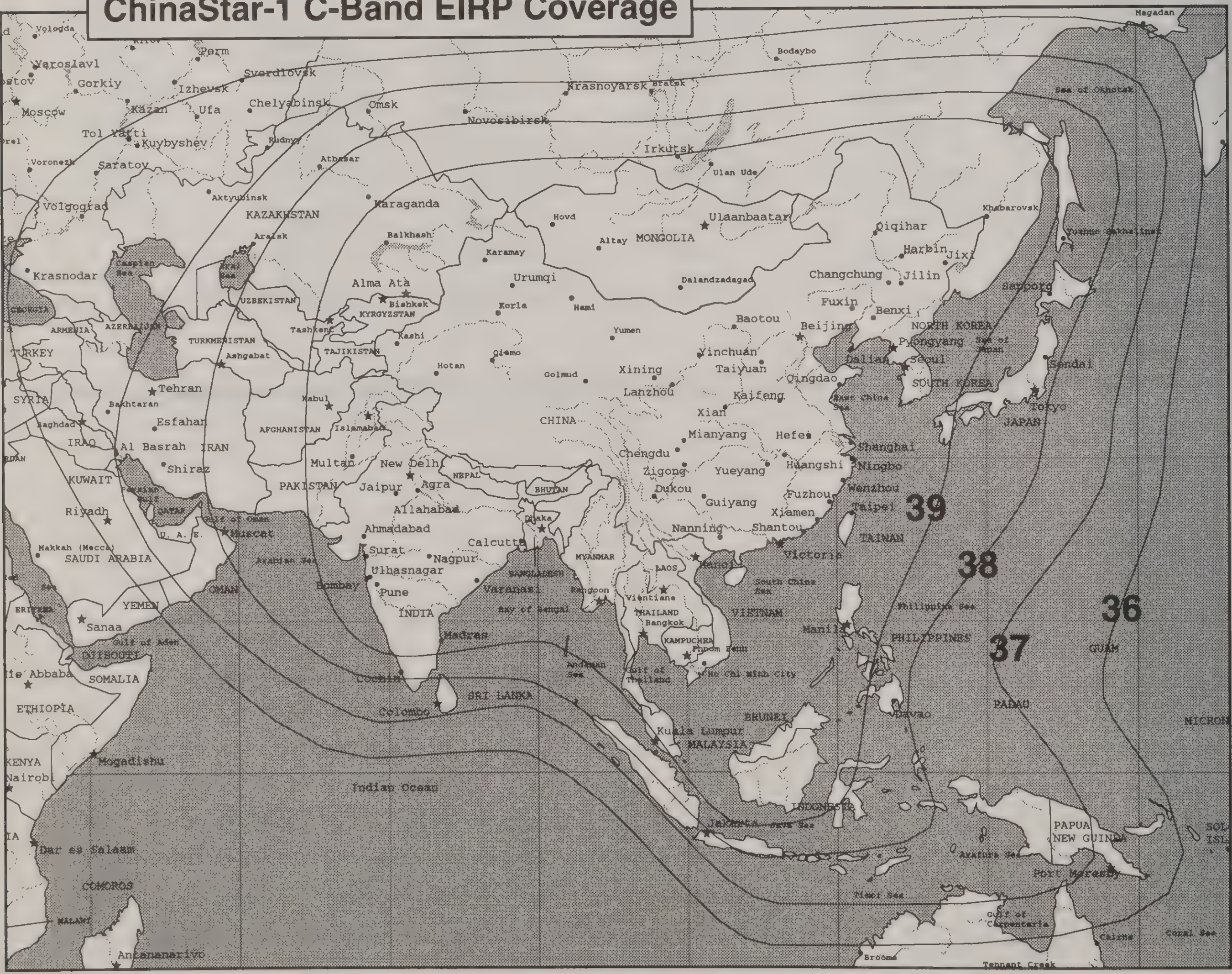
ChinaStar-1

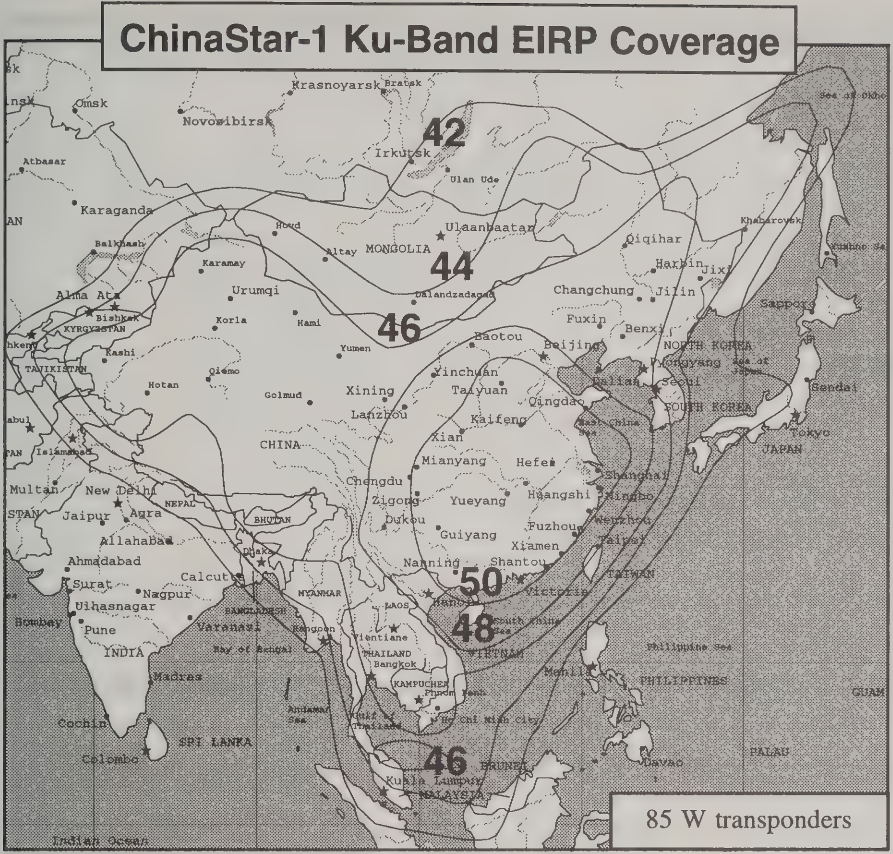
Orbital location:	87.5ºE
Launch:	Late 1997, Long March 3B
Expected lifetime:	15 years
Expected end of life:	2012

Antennas beam coverage overview:

C-band and Ku-band:	China, South Asia, West, Central, East and Southeast Asia

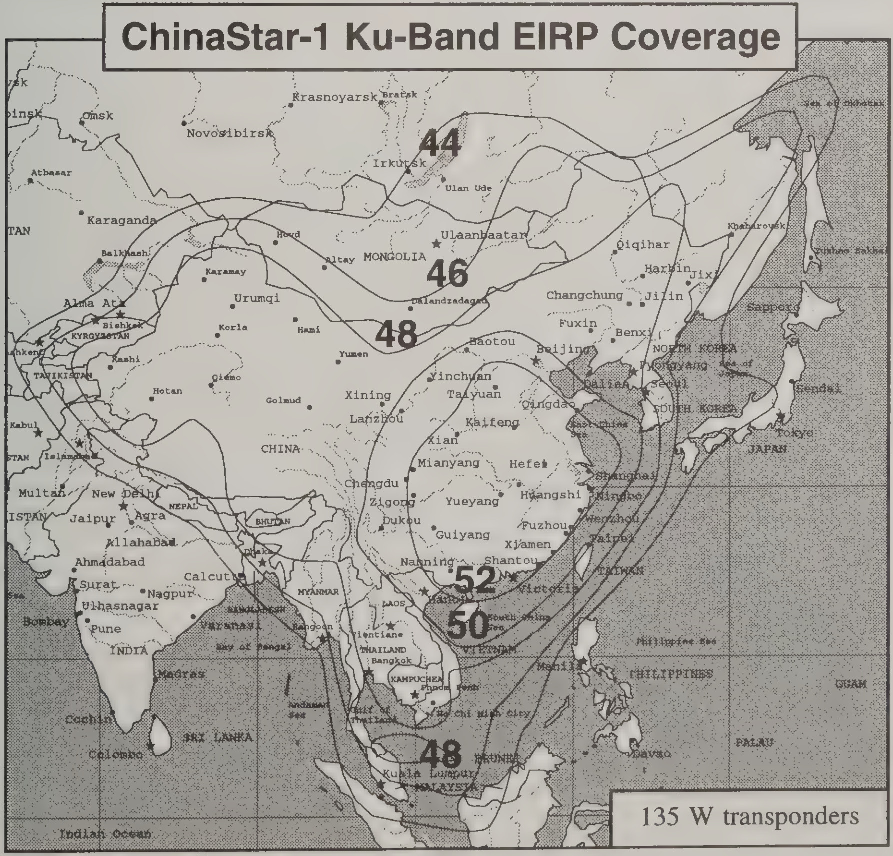
ChinaStar-1 C-Band EIRP Coverage





ChinaStar-1 Ku-Band EIRP Coverage

85 W transponders



ChinaStar-1 Ku-Band EIRP Coverage

135 W transponders

SINOSAT COMMUNICATIONS COMPANY

CHINA

Contact:

Mr. Jean Marie Robert, 492923396

Overview:

Plans to launch the Sinosat system in the summer of 1997.

SINOSAT SYSTEM At A Glance

Satellite name: .... Sinosat 1, TBA;
Sinosat 2, TBA

Spacecraft data:
- Mass (at launch): .... 2,800 kg
- Mass (in orbit): .... 1,600 kg
- Launch date: .... Summer 1997
- Launch vehicle: .... Long March 3
- Expected lifetime: .... 15 years

Transponders:
- Number: .... 14 Ku-band @ 97 W,
  24 C-band @21 W

Manufacturer: .... Aerospatiale

ASIA CELLULAR SATELLITE (ACeS)

Sentra Mulia
Suite 1208
Jl. H.R. Rasuna Said Kav. X-6, No. 8
Jakarta 12940
INDONESIA

Telephone:	+62 (21)522-2050
Facsimile:	+62 (21)522-2044

Contact:

Ratna Djuwita, Administrative Secretary

Public Relations Contact:

Margaret Patterson, Manager of Corporate Relations

Overview:

Garuda 1 will be launched in September 1998. Asia Cellular Satellite (ACeS) is a joint venture between Pasifik Satelit Nusantara of Indonesia, Philippine Long Distance Telephone Company of the Philippines and Jasmine International Overseas Company Ltd. of Taiwan.

Services Proposed:

- Dual mode handsets (satellite and cellular) deployed anywhere in the Asian service region

Status:

AP4 was filed for extended C- and L-band allocations in September 1993.

Satellite Control Network:

TT&C station:	Batam Island, Indonesia

ASIA CELLULAR SATELLITE (ACeS) SYSTEM At A Glance

Satellite name:	Garuda 1, 123°E; Garuda 2, TBA
Spacecraft data:	
Area of coverage:	Asia-Pacific region
Mass (orbit):	2,600 kg
Primary power (EOL):	10.5 kW
Eclipse protection:	100%
Stabilization:	3-axis
Launch date:	September 1998
Launch vehicle:	Proton D-1-e
Expected lifetime:	12 years
Transponders:	
Band:	L-band service links, extended C-band feeder links
Power output:	73 dBW (L-band), 34 dBW (extended C-band)
Polarization:	Circular (L-band), Linear (extended C-band)
Bandwidth:	34 MHz (L-band), 300 MHz (extended C-band)
EIRP (dBW):	73 (L-band), 34 (extended C-band)
Uplink frequency:	1.6265-1.6605 (L-band); 6.425-6.725 (extended C-band)
Downlink frequency:	1.525-1.559 (L-band); 3.400-3.700 (extended C-band)
Redundancy:	10:8 SSPAs
G/T:	+15.3 dB/K (L-band), -6.5 dB/K (C-band)
Baseband processor:	Transparent digital processor
Manufacturer:	Lockheed Martin Astrospace

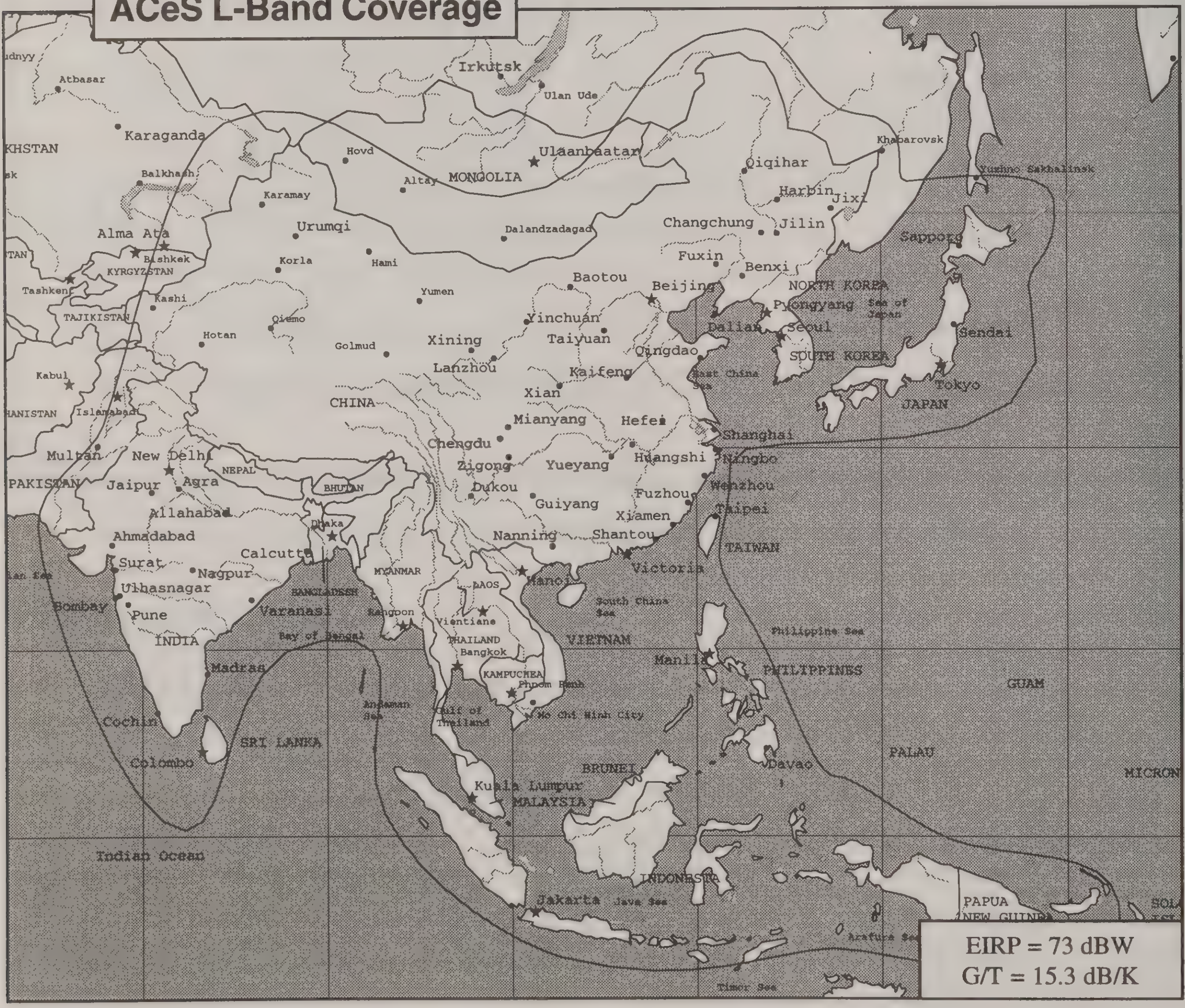
Garuda 1 and 2

Orbital location:	123°E (1), TBA (2)
Launch:	September 1998, Proton D-1-e
Expected lifetime:	12 years
Expected end of life:	2010

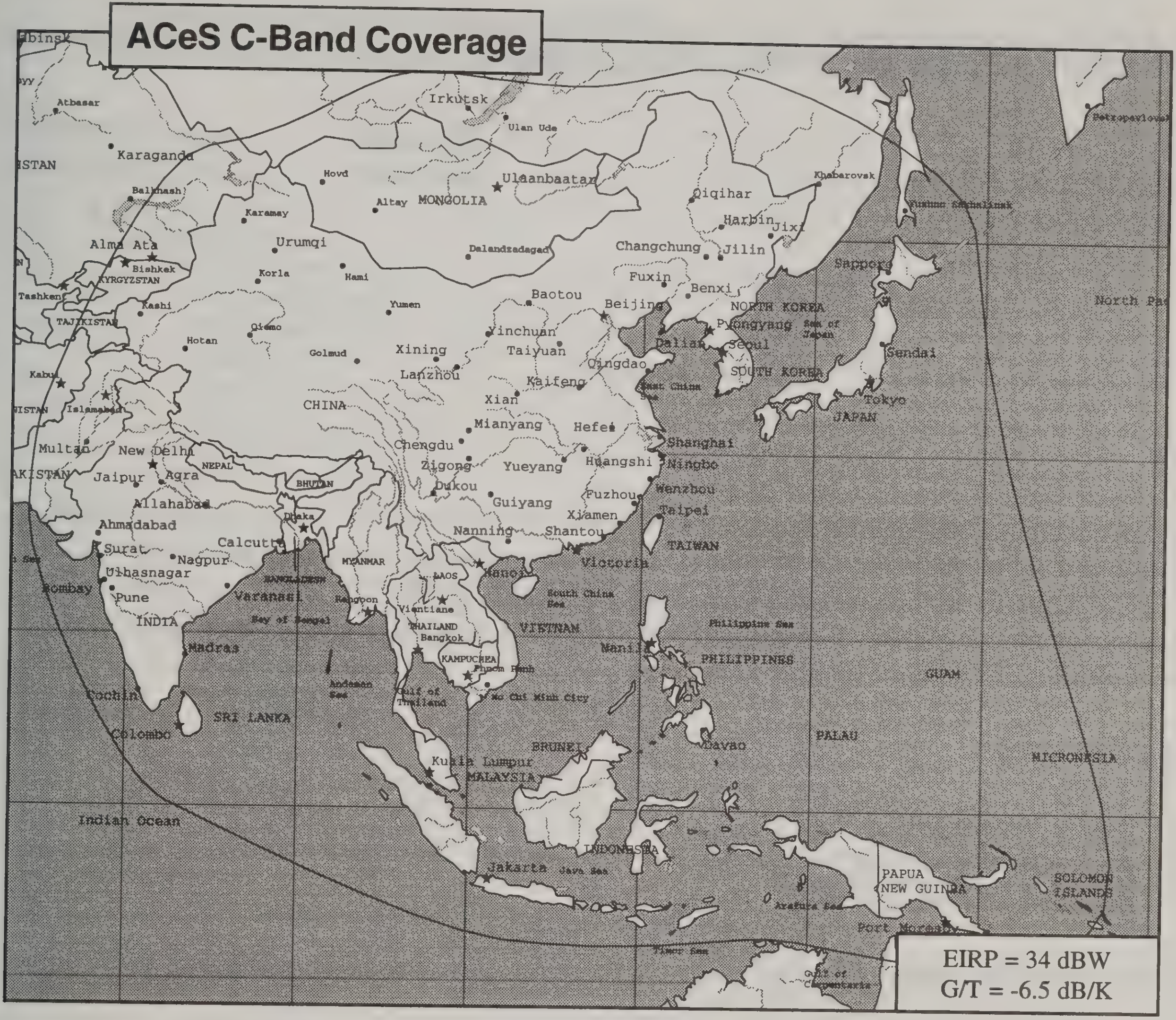
Antennas beam coverage overview:

L-band and extended C-band:	Asia-Pacific region

ACeS L-Band Coverage



EIRP = 73 dBW
G/T = 15.3 dB/K



ACeS C-Band Coverage

EIRP = 34 dBW
G/T = -6.5 dB/K

P.T. MEDIACITRA INDOSTAR

Jalan Kebon Sirih 17-19
Jakarta 10340
INDONESIA

Telephone: +62 21-390-9211
Facsimile: +62 21-545-1748

Contact:

Jason O'Neil, Vice President, +1(301)816-1242

Overview:

Plans to launch Indostar, a direct broadcast satellite of the lightsat class. It is designed to provide DBS television and digital audio broadcast radio (DAB) to the entire nation of Indonesia. It will be placed in geosynchronous orbit 35,000 kilometers above Indonesia at 105°E to 115°E. CTA International will manufacture the satellite. Indostar will broadcast forty channels of television to small 1.1m dish antennas. Billing and authorization is via "Smart card."

Proposed Services:

- Digital DBS television
- Analog DBS television
- Digital audio broadcast radio

Satellite Control Network:

TT&C station: Jakarta, Indonesia

INDOSTAR SYSTEM At A Glance

Satellite name:	Indostar-1, 105°E; Indostar-2, 118.9°E; Indostar-3, 107.5°E; Indostar-4, 119.1°E
Spacecraft data:	
Area of coverage:	Indonesia
Mass (in orbit):	1,380 kg
Primary power (EOL):	1,850 W
Eclipse protection:	Yes
Stabilization:	3-axis
Launch date:	2nd quarter 1997 (1); TBA (2, 3, 4)
Launch vehicle:	Ariane 4 or 5
Expected lifetime:	12 years
Transponders:	
Number:	5
Power output:	70 W TWTA
Frequency bands:	S-band, X-band for programming uplink
Polarization:	Linear
Redundancy:	7:5
G/T:	5.3 dB/K
Uplink G/T:	14 dB fade margin (X-band)
Receive G/T:	2.3 dB/K EOC
Antenna beam:	8.3° x 3.6° ellipse
Broadcast frequencies:	1.467-1.492 GHz (radio), 2.520-2.670 GHz (television)
Baseband processor:	Intel
Single carrier saturation flux density:	-152.0 dBW/m2 per 4 KHz
Manufacturer:	CTA International

PASIFIK SATELIT NUSANTARA (PSN)

Sentra Mulia
Suite 1201
Jl. H.R. Rasuna Said Kav. X-6, No. 8
Jakarta 12940
INDONESIA

Telephone:	+62 (21)522-9292
Facsimile:	+62 (21)522-9293
Corporate E-mail:	psnsat@rad.net.id

Contact:

Ratna Djuwita, Administrative Secretary

Public Relations Contact:

Margaret Patterson, Manager of Corporate Relations

Overview:

PSN is vertically integrating its business with operations encompassing the ownership and leasing of satellite capacity through to telecommunications services offered direct to end-users.

Services Proposed:

- Multimedia services

Status:

First launch is expected in January 1999.

Satellite Control Network:

TT&C station: Cikarang, Jakarta, Indonesia

M^{2}A (MULTI-MEDIA ASIA) SYSTEM At A Glance

Satellite name: M^{2}A, 118°E or 134°E

Spacecraft data:
- Area of coverage: Asia-Pacific region
- Mass (orbit): 2,847 kg
- Primary power (EOL): 10.6 kW
- Eclipse protection: 100%
- Stabilization: 3-axis
- Launch date: January 1999
- Launch vehicle: Proton D-1-e
- Expected lifetime: 12 years

- Transponders:
  - Number: 54
  - Band: Extended C-band, standard C-band and X-band
  - Power output: 20 W, 60 W, 120 W, 240 W
  - Polarization: Linear
  - Redundancy: 32 for 24 120 W TWTA,
6 for 4 120 W DTWTA (Extended C-band);
16 for 12 20 W SSPA,
16 for 12 60 W TWTA (Standard C-band);
4 for 2 120 W DTWTA (X-band)
  - G/T: 1 dB/K

  - Single carrier saturation flux density: -85 dBW/m^2

- Manufacturer: Space Systems/Loral

MABUHAY PHILIPPINES SATELLITE CORPORATION

22/F Rufino Pacific Tower
6784 Ayala Avenue
1200 Makati
PHILIPPINES

Telephone: +63 2-811-0983
Facsimile: +63 2-811-0990
Corporate E-mail: mabuhay@mnl.sequel.net

Booking Contact:

Mr. Benedicto O. Bulatao, Marketing Coordinator

Contact:

Mr. Peter L. So

Public Relations Contact:

Mr. Gonzalo A. Villa

Overview:

Mabuhay Philippines Satellite Corporation was formed to serve the transponder requirements of the regional market.

AGILA SYSTEM At A Glance

Satellite name:	Agila-II, 144°E
Spacecraft data:	
Area of coverage:	Japan to Indonesia, India to the Philippines and spot beam at Hawaii (C-band); Coastal China, Taiwan, Hanoi and the Philippines (Ku-band)
Mass (in orbit):	3,768 kg (separated)
Primary power:	Greater than 7,500 W
Eclipse protection:	100%
Stabilization:	3-axis
Launch date:	May 31, 1997
Launch vehicle:	Long March 3B
Expected lifetime:	12 years
Transponders:	
Number:	30 C-band, 24 Ku-band
Power output:	27 W C-band; 110 W (medium) and 220 W (high) Ku-band
Polarization:	Horizontal and vertical
Redundancy:	2x19 for 15 C-band; 2x8 for 6 (high) and 2x16 for 12 (medium) Ku-band
G/T:	-3 dB/K (main beam), -5 dB/K (spot beam) C-band; +5 dB/K (high power), +3 dB/K (medium power) Ku-band
Baseband processor:	Spacecraft Control Electronics
Manufacturer:	Space Systems/Loral

Agila-II Transponder Frequency Plan

Standard C-band

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	36	37	5.945	3.720
2	H	36	37	5.965	3.740
3	V	36	37	5.985	3.760
4	H	36	37	6.005	3.780
5	V	36	37	6.025	3.800
6	H	36	37	6.045	3.820
7	V	36	37	6.065	3.840
8	H	36	37	6.085	3.860
9	V	36	37	6.105	3.880
10	H	36	37	6.125	3.900
11	V	36	37	6.145	3.920
12	H	36	37	6.165	3.940
13	V	36	37	6.185	3.960
14	H	36	37	6.205	3.980
15	V	36	37	6.225	4.000
16	H	36	37	6.245	4.020
17	V	36	37	6.265	4.040
18	H	36	37	6.285	4.060
19	V	36	37	6.305	4.080
20	H	36	37	6.325	4.100
21	V	36	37	6.345	4.120
22	H	36	37	6.365	4.140
23	V	36	37	6.385	4.160
24	H	30	37	6.405	4.177
Extended C-band					
25	V	36	37	6.605	3.580
26	H	36	37	6.625	3.600
27	V	36	37	6.645	3.620
28	H	36	37	6.665	3.640
29	V	36	37	6.685	3.660
30	H	36	37	6.705	3.680

Agila-II Ku-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)*	Uplink(GHz)	Downlink(GHz)
1	H	36	55/52	14.039	12.221
2	H	36	55/52	14.079	12.261
3	H	36	55/52	5.985	12.301
4	H	36	55/52	6.005	12.341
5	H	36	55/52	6.025	12.381
6	H	36	55/52	6.045	12.421
7	H	36	55/52	6.065	12.461
8	H	36	55/52	6.085	12.501
9	H	36	55/52	6.105	12.541
10	H	36	55/52	6.125	12.581
11	H	36	55/52	6.145	12.621
12	H	36	55/52	6.165	12.661
13	V	36	55/52	6.185	12.221
14	V	36	55/52	6.205	12.261
15	V	36	55/52	6.225	12.301
16	V	36	55/52	6.245	12.341
17	V	36	55/52	6.265	12.381
18	V	36	55/52	6.285	12.421
19	V	36	55/52	6.305	12.461
20	V	36	55/52	6.325	12.501
21	V	36	55/52	6.345	12.541
22	V	36	55/52	6.365	12.581
23	V	36	55/52	6.385	12.621
24	V	36	55/52	6.405	12.661

*55 dBW operating at high power mode, 52 dBW operating at medium power mode

GASCOM

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Kaliningrad, Moscow 141070
RUSSIA

Telephone: +7 (095) 513-66-28
Facsimile: +7 (095) 513-69-02

Overview:

Plans to launch Yamal 1 and Yamal 2 in 1997.

Proposed Services:

- Telephone
- Facsimile
- Data transmission
- Video teleconference communication
- Digital flows transmission

YAMAL SYSTEM At A Glance

Satellite name: Yamal 1, 75°E; Yamal 2, 340.5°E (19.5°W)

Spacecraft data:
- Area of coverage: Asia, Africa, Australia, South America, and the eastern United States
- Mass (at launch): 1,300 to 1,360 kg
- Primary power (EOL): 1,300 W
- Launch date: mid-1997
- Launch vehicle: Proton
- Expected lifetime: 10 years

- Transponders:
  - Power output: 2,500 W
  - Frequency band: 4/6 GHz
  - EIRP: 40 dBW

- Manufacturer: Space Systems/Loral

MINISTRY OF POST, TELEGRAPH AND TELEPHONE (SAUDI ARABIA)

Director-General
Riyadh 1112
SAUDI ARABIA

Telephone: +966 1-4637100
Facsimile: +966 1-4032048

Overview:

Plans to launch the SABS Ku-band satellite system to supply telecommunications and DBS to Saudi Arabia. This might also carry an L-band mobile service payload.

Proposed Services:

- Point-to-point telecommunications
- DBS
- Mobile

SABS SYSTEM At A Glance

Satellite name: .... SABS 1 and SABS 2, 17°E (one operational, one in-orbit spare)

Spacecraft data:

- Area of coverage: .... Saudi Arabia and surrounding area
- Launch date: .... TBD
- Expected lifetime: .... 10 years

- Transponders:
  - Uplink frequency: .... 14.0-14.8 GHz
  - Downlink frequency: .... 11.7-12.5 GHz

SINGAPORE TELECOMMUNICATIONS LTD.

31 Exeter Road
#20-00 Comcentre
Singapore 239732
SINGAPORE

Telephone:	+65 838-2758
Facsimile:	+65 734-8119
Corporate E-mail:	ltmn%itbp%st@singtel.com
Web Site Address:	www.singtel.com

Contact:

Loo Tong Mun, Senior Manager

Overview:

Singapore Telecom plans to launch its first satellite, ST-1, in February 1998.

Status:

Full turnkey satellite contract signed on April 1, 1996 with Matra Marconi Space France. Expected first launch: February 1998.

Satellite Control Network:

TT&C station:	Seletar earth station, Singapore

ST-1 SYSTEM At A Glance

Satellite name:	ST-1, 88°E
Spacecraft data:	
Area of coverage:	South and East Asia (Ku-band), Middle East to Far East (C-band)
Stabilization:	3-axis
Launch date:	February 1998
Launch vehicle:	Ariane
Expected lifetime:	12 years
Transponders:	
Number:	16 Ku-band, 14 C-band
Power output:	7 Kw
Polarization:	Vertical and horizontal
Manufacturer:	Matra Marconi Space

ST-1 C-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1A	H up, V down	36	40.4	6.452	3.427
1B	V up, H down	36	40.4	6.452	3.427
2A	H up, V down	36	40.4	6.493	3.468
2B	V up, H down	36	40.4	6.493	3.468
3A	H up, V down	36	40.4	6.534	3.509
3B	V up, H down	36	40.4	6.534	3.509
4A	H up, V down	36	40.4	6.575	3.550
4B	V up, H down	36	40.4	6.575	3.550
5A	H up, V down	36	40.4	6.616	3.591
5B	V up, H down	36	40.4	6.616	3.591
6A	H up, V down	36	40.4	6.657	3.632
6B	V up, H down	36	40.4	6.657	3.632
7A	H up, V down	36	40.4	6.698	3.573
7B	V up, H down	36	40.4	6.698	3.573

ST-1 Ku-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
K1 or K2					
1A	H up, V down	54	49.2/51.4*	14.028	11.483
1B	V up, H down	54	49.2/51.4*	14.028	11.483
2A	H up, V down	54	49.2/51.4*	14.091	11.546
2B	V up, H down	54	49.2/51.4*	14.091	11.546
3A	H up, V down	54	49.2/51.4*	14.154	11.609
3B	V up, H down	54	49.2/51.4*	14.154	11.609
4A	H up, V down	54	49.2/51.4*	14.217	11.672
4B	V up, H down	54	49.2/51.4*	14.217	11.672
K1 only					
5A	H up, V down	54	49.2/52.2**	14.283	12.528
5B	V up, H down	54	49.2/52.2**	14.283	12.528
6A	H up, V down	54	49.2/52.2**	14.346	12.591
6B	V up, H down	54	49.2/52.2**	14.346	12.591
7A	H up, V down	54	49.2/52.2**	14.409	12.654
7B	V up, H down	54	49.2/52.2**	14.409	12.654
8A	H up, V down	54	49.2/52.2**	14.472	12.717
8B	V up, H down	54	49.2/52.2**	14.472	12.717

*49.2 K1 region; 51.4 K2 region
**49.2 K1 region; 52.2 K1 spot

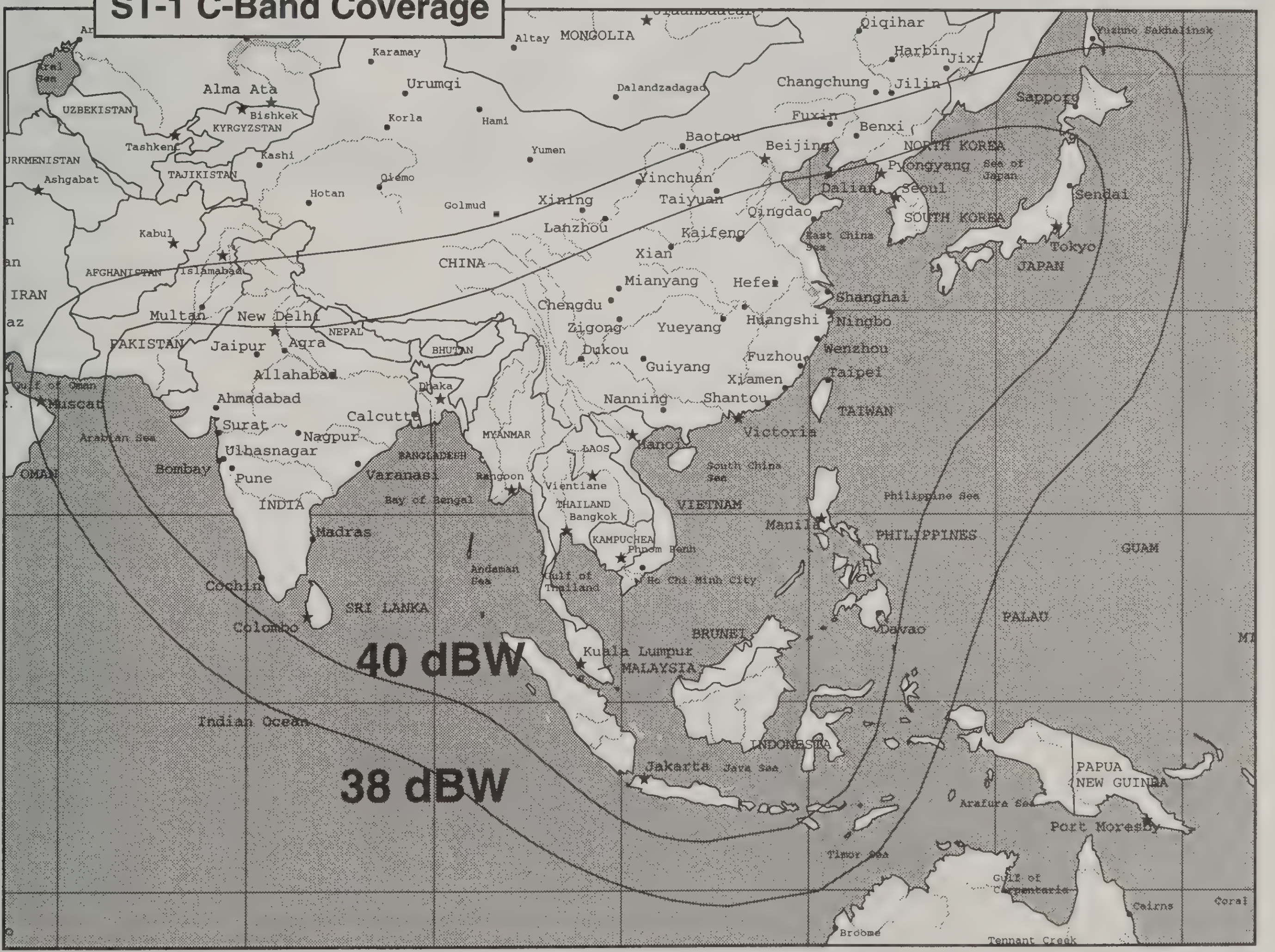
ST-1

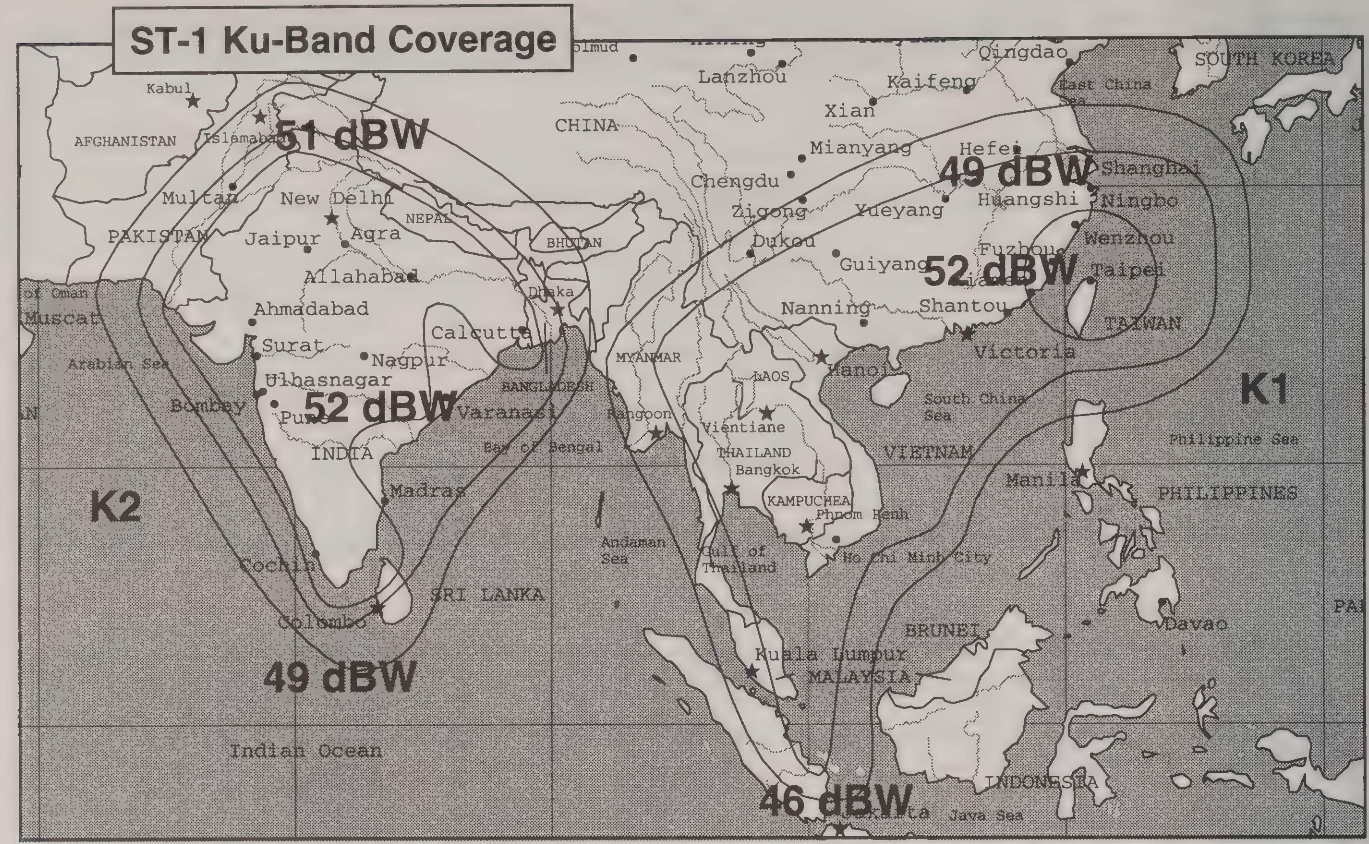
Orbital location:	88°E
Launch:	February 1998, Ariane
Expected lifetime:	12 years
Expected end of life:	2010

Antennas beam coverage overview:

C-band:	Middle East to Far East
Ku-band:	South and East Asia

ST-1 C-Band Coverage





ST-1 Ku-Band Coverage

CD RADIO INC.

1001 22nd Street NW
Sixth Floor
Washington, DC 20037
USA

Telephone:	(202)296-6192
Facsimile:	(202)296-6265
Corporate E-mail:	cdrd@his.com

Contact:

Robert D. Briskman, President of CD Radio Systems

Overview:

Plans to operate a nationwide CD-quality satellite digital radio service primarily for passengers in automobiles. CD radio service will be offered on a subscription basis and will be commercial free. CD Radio will construct, launch and operate two high power satellites covering the contiguous United States.

Satellite Control:

TT&C stations: Washington, DC

CD RADIO SYSTEM At A Glance

Satellite name:	CD Radio I, 280°E (80°W) CD Radio II, 250°E (110°W)
Spacecraft data:	
Area of coverage:	USA 48 states
Mass (on launch):	2,182 kg
Primary power (EOL):	5,700 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	1999
Launch vehicle:	Ariane IV/V
Expected lifetime:	15 years
Transponders:	
Number:	1 (provides 30 CD music channels and 20 voice channels)
Power output:	2,000 W
Polarization:	Left hand circular
Redundancy:	1:2
Frequency:	S-band (to operate in a multiple-entry regime that allows other DAR systems to share FCC-allocated frequencies)
Uplink frequency:	7.1 GHz
Transmit frequency:	2.310-2.360 GHz
EIRP (beam center):	6.11 dBW
Bandwidth (with frequency diversity):	12.5 MHz
Antenna beam:	3° x 7°
Uplink G/T:	1 dB/K
Receive G/T:	-19 dB/K
Manufacturer:	Space Systems/Loral

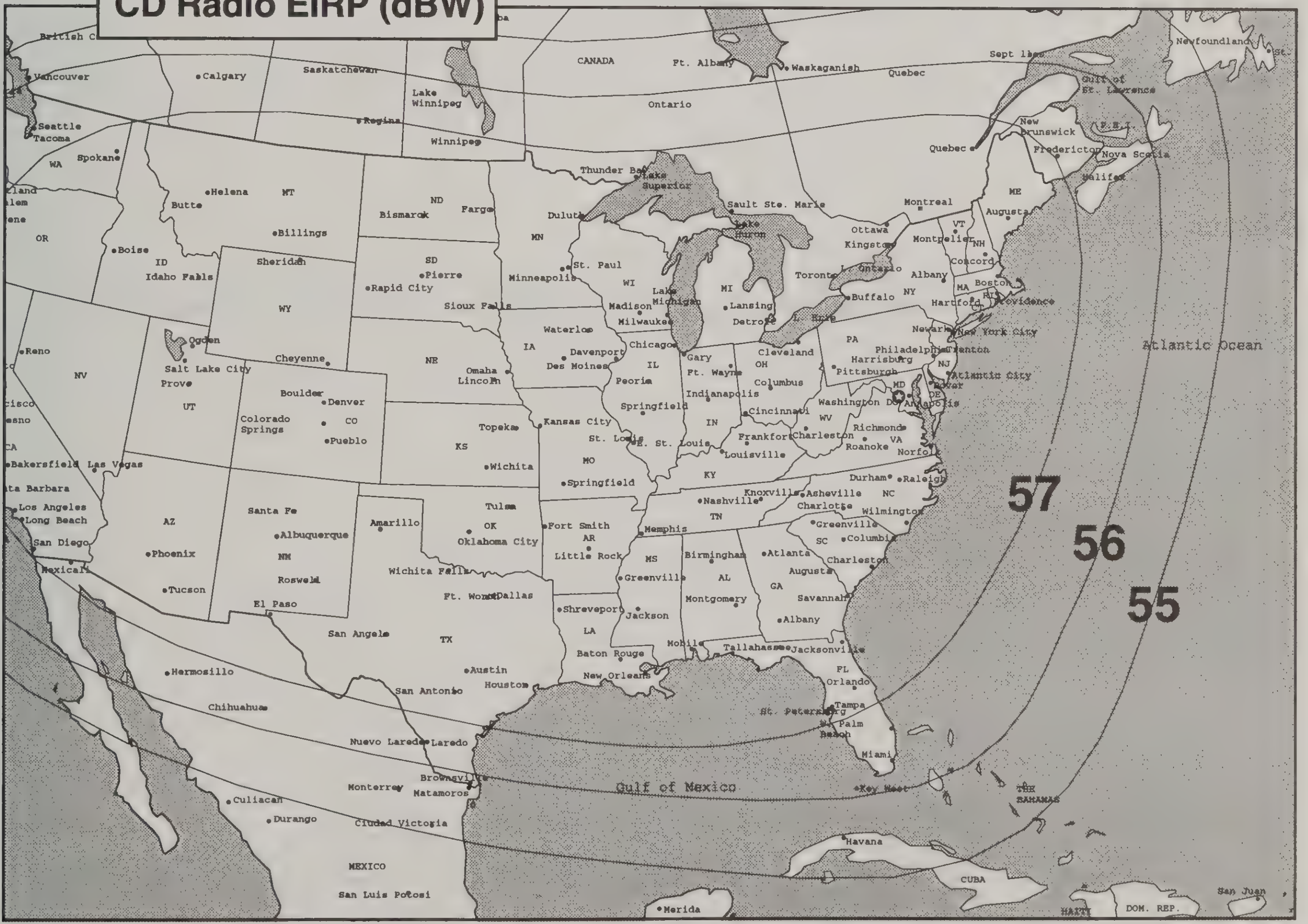
CD Radio I and II

Orbital location:	280ºE (80°W) [I], 250ºE (110°W) [II]
Launch date:	1999, Ariane IV/V
Expected lifetime:	15 years
Expected end of life:	2014

Antennas beam coverage overview:

S-band:	Conus

CD Radio EIRP (dBW)



DIRECTSAT CORPORATION

c/o SSE Telecom Inc.
47823 Westinghouse Drive
Fremont, CA 94539
USA

Telephone:	(510)657-7552
Facsimile:	(510)490-8501

Contact:

Fred C. Toombs, President
Daniel Moore, Executive Vice President and Chief Financial Officer

Overview:

Plans to operate two 16-channel DBS satellites. The Directsat system intends to operate in a partnership with EchoStar Communications Corporation.

Proposed Services:

- DBS

Status:

The FCC granted Directsat an extension until April 15, 1999, for construction and launch of its satellites.

DIRECTSAT SYSTEM At A Glance

Satellite name:	Directsat, 241°E (119° W) and 185°E (175° W)
Spacecraft data:	
Area of coverage:	Conus (each satellite)
Launch date:	1999
Transponders:	
Number:	16
Power output:	130 W TWTA

DOMINION VIDEO SATELLITE INC.

5551 Ridgewood Drive
Suite 505
Naples, FL 33963
USA

Telephone:	(941)403-9130
Facsimile:	(941)403-9104

Contacts:

Robert W. Johnson, Chairman and Chief Executive Officer
Allen G. Rundle, President and Chief Operating Officer
Pelle Karlsson, Senior Advisor
Rob Johnson, Vice President of Finance
Randall Swanson, Vice President and General Counsel
Leonard C. Mitchell, Vice President of Engineering
Charles Duke, Director of Engineering

Public Relations Contact:

Charles Segura, Vice President of Marketing

Overview:

DBS licensee for eight channels at an eastern slot and eight channels in a western slot to be assigned. Scheduled to launch in December 1998. Has a contract to construct two Orbital Sciences Corporation DBS series satellites, and has a launch contract with McDonnell Douglas Commercial Delta.

Proposed Services:

- DBS
- Radio
- Data

DVS SYSTEM At A Glance

Satellite name:	DVS-1, 298.5°E (61.5°W); DVS-2, 194°E (166°W)
Spacecraft data:	
Area of coverage:	USA 50 states
Primary power:	120 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	December 1998
Launch vehicle:	Delta II
Expected lifetime:	12 years
Transponders:	
Number:	8
Primary power (EOL):	130 W TWTA
Polarization:	LHCP
Redundancy:	4:8
Uplink frequency:	17.33858-17.77598 GHz
Downlink frequency:	12.23858-12.67598 GHz
Bandwidth:	24 MHz
EIRP:	52 dBW
Manufacturer:	Fairchild

LORAL SPACE & COMMUNICATIONS INC.

600 Third Avenue
New York NY 10016
USA

Telephone:	(212)697-1105
Facsimile:	(212)661-8988

Overview:

Plans to launch the Loralsat system in 1999.

LORALSAT SYSTEM At A Glance

Satellite name:	Loralsat 1, 283°E (77°W) Loralsat 2, 231°E (129°W)
Spacecraft data:	
Area of coverage:	Conus, Hawaii, Alaska, Puerto Rico, and the Virgin Islands
Launch date:	1999
Expected lifetime:	12 years
Transponders:	
Number:	24 C-band @ 20 W, 32 Ku-band @ 110 W
Manufacturer:	Space Systems/Loral

WORLDSPACE INC.

1730 Rhode Island Avenue NW
Washington, DC 20036
USA

Telephone:	(202)408-8071
Facsimile:	(202)408-5292
Corporate E-mail:	user@mail.worldspace.com
Web Site Address:	199.171.16.53/worldspace/

Contact:

Joseph Campanella, Chief Technical Officer

Overview:

Will construct, launch and operate AfriStar, CaribStar and AsiaStar satellite sound broadcasting systems to facilitate radio broadcasting worldwide. The WorldSpace system will export radio channels to major international, national and regional broadcasters who then "spacecast" their programming directly to a new generation of portable digital radio receivers called StaRman™. The launch of AfriStar, an audio-only satellite, is scheduled for May or June 1998. AsiaStar and CaribStar are scheduled for a late 1998 and early 1999 launch respectively.

Proposed Services:

- DAB
- Free-to-air service
- Subscription radio service
- Datacasting

Satellite Control Network:

TT&C stations:	Republic of Trinidad and Tobago (CaribStar) Australia (AsiaStar)

AFRISTAR SYSTEM At A Glance

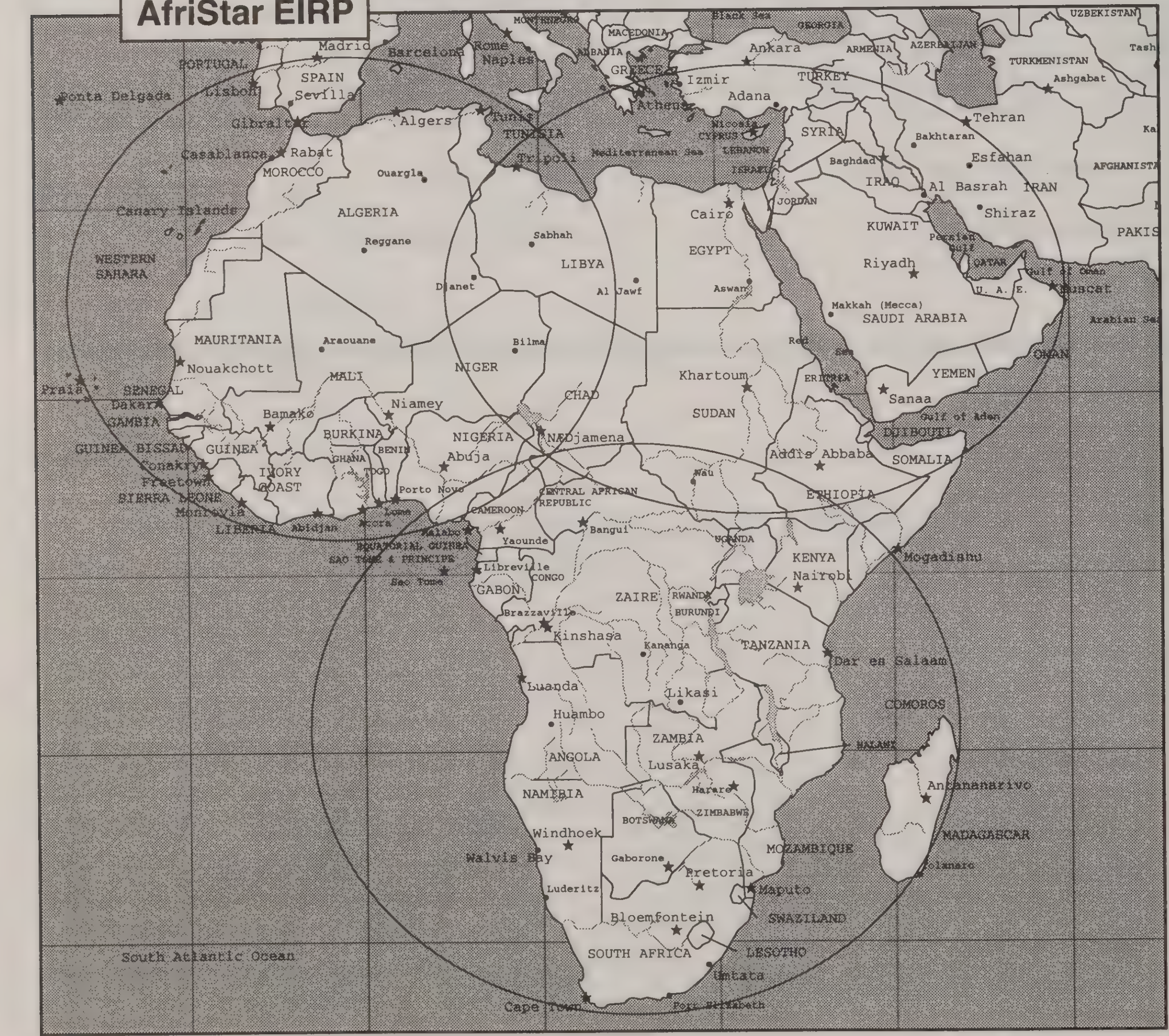
Satellite name:	AfriStar, 21°E
Spacecraft data:	
Area of coverage:	Africa and the Middle East
Mass (at launch):	2,200 kg
Primary power (EOL):	3,000 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	May or June 1998
Launch vehicle:	Ariane
Expected lifetime:	15 years
Transponders:	
Number:	3 active; 5 available
Power output:	300 W TWTA
Frequency bands:	L-band, X-band
Polarization:	Circular
EIRP:	54 dBW
G/T:	-17 dB/K
Receive G/T:	-13.4 dB/K
Single carrier saturation flux density:	-94.7 dBW/m^2
Manufacturer:	Alcatel Espace/Alenia Spazio

AfriStar

Orbital location:	21°E
Launch:	May or June 1998, Ariane
Expected lifetime:	15 years
Expected end of life:	2013

Antennas beam coverage overview:

L-band:	Africa and the Middle East



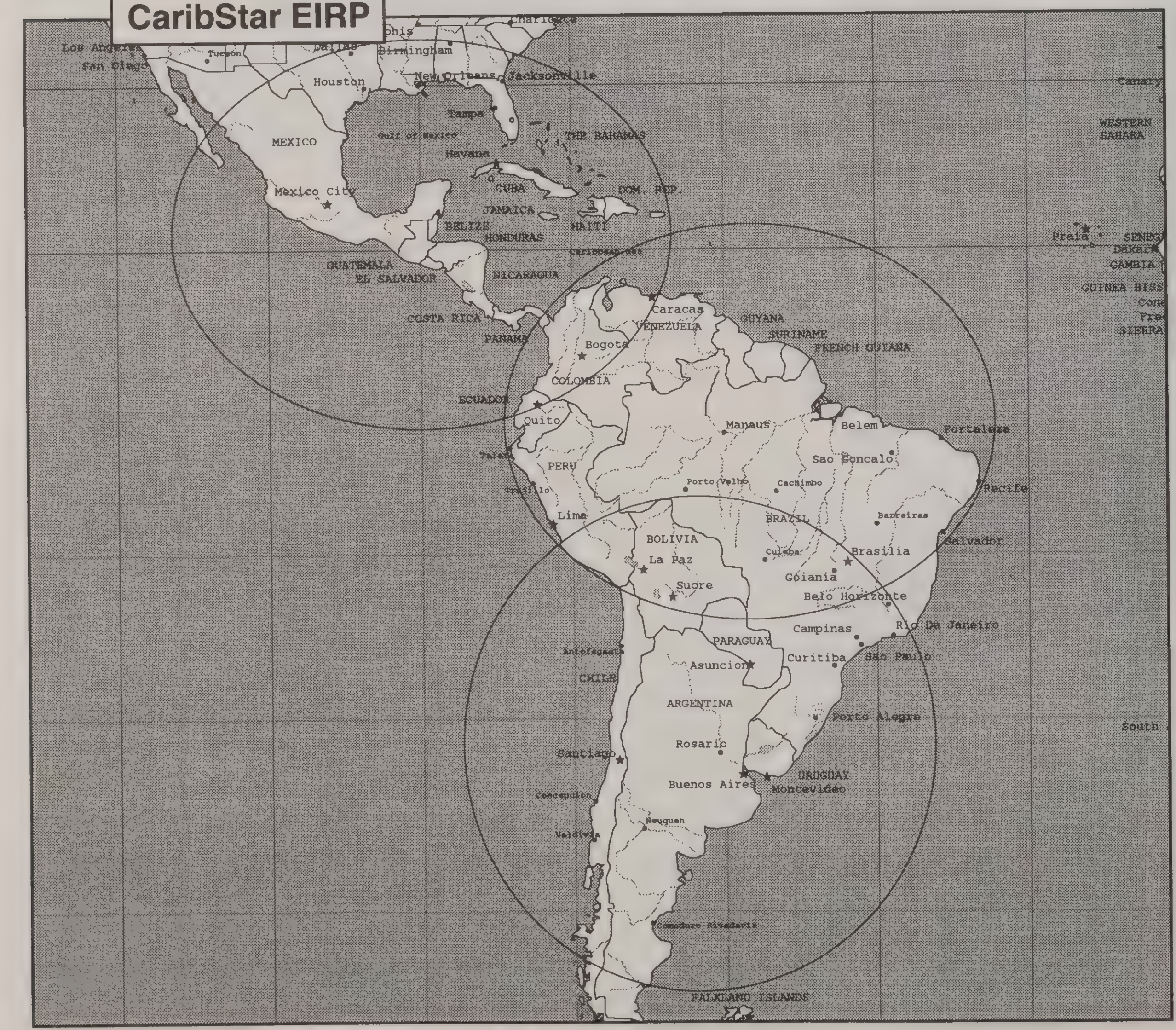
AfriStar EIRP

CARIBSTAR SYSTEM At A Glance

Satellite name:	CaribStar, 315ºE (45°W)
Spacecraft data:	
Area of coverage:	Latin America
Mass (at launch):	2,200 kg
Primary power:	3,000 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	Early 1999
Launch vehicle:	Ariane
Expected lifetime:	15 years
Transponders:	
Number:	3 active, 5 available
Power output:	300 W TWTA
Frequency bands:	L-band, X-band
Polarization:	Circular
EIRP:	54 dBW
G/T:	-12 dB/K
Receive G/T:	-13.4
Single carrier saturation flux density:	-94.7 dBW/m^2
Manufacturer:	Alcatel Espace/Alenia Spazio

CaribStar

Orbital location:	315ºE (45°W)
Launch:	Early 1999, Ariane
Expected lifetime:	15 years
Expected end of life:	2014
Antennas beam coverage overview:	
L-band:	Latin America


CaribStar EIRP

ASIASTAR SYSTEM At A Glance

- Satellite name: AsiaStar, 105°E
- Spacecraft data:
  - Area of coverage: South, Southeast and Northeast Asia
  - Mass (at launch): 2,200 kg
  - Primary power: 2,200 W
  - Eclipse protection: All transponders
  - Stabilization: 3-axis
  - Launch date: November or December 1998
  - Launch vehicle: Ariane
  - Expected lifetime: 15 years

  - Transponders:
    - Number: 3 active, 5 available
    - Power output: 300 W TWTA
    - Frequency bands: L-band; X-band
    - Polarization: Circular
    - EIRP: 54 dBW
    - G/T: -12 dB/K
    - Receive G/T: -13.4 dB/K

  - Single carrier saturation flux density: -94.7 dBW/m^2

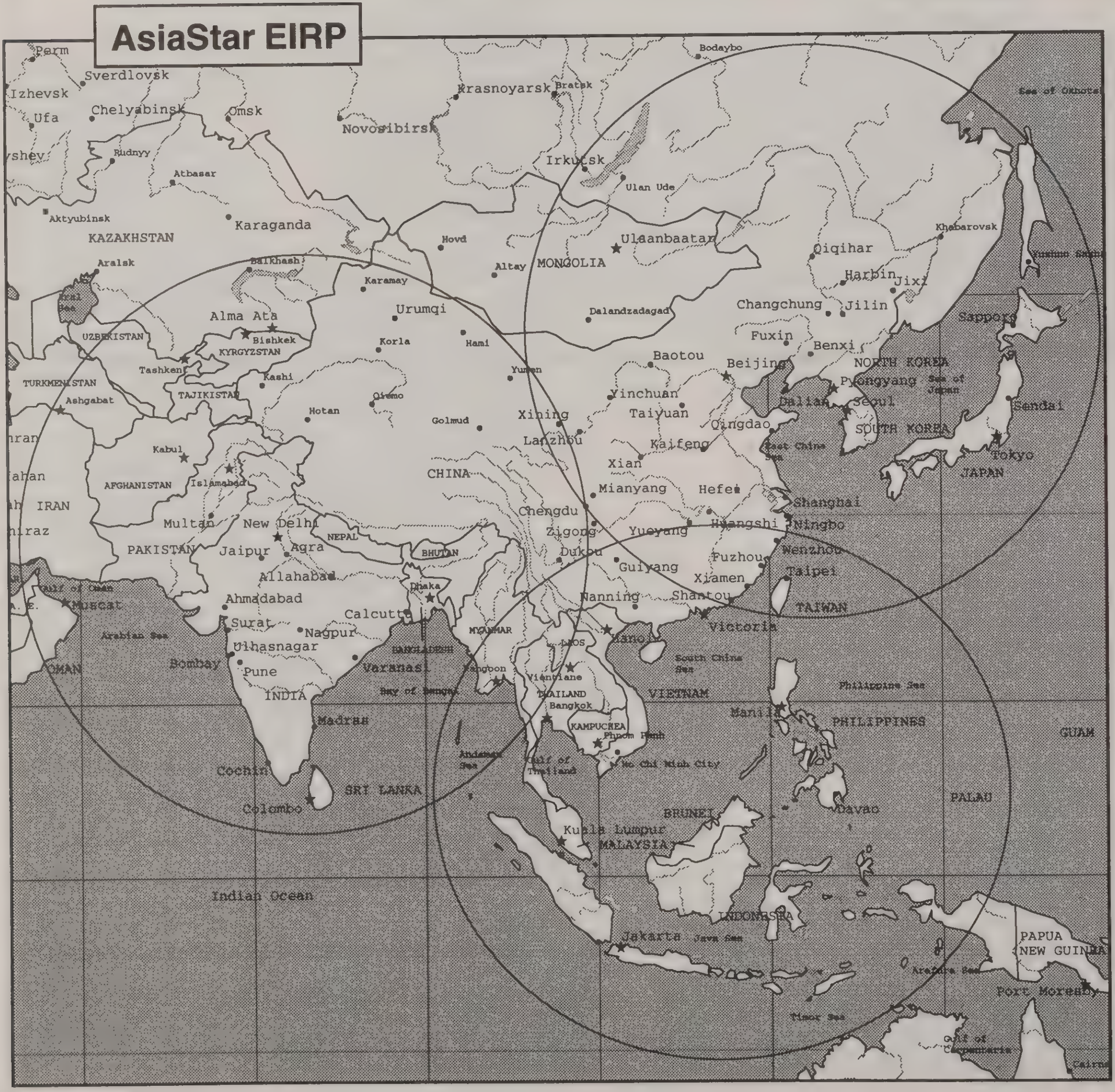
  - Manufacturer: Alcatel Espace/Alenia Spazio

AsiaStar

Orbital location:	105ºE
Launch:	November or December 1998, Ariane
Expected lifetime:	15 years
Expected end of life:	2013

Antennas beam coverage overview:

L-band:	South, Southeast and Northeast Asia



AsiaStar EIRP

SECTION 4

PLANNED NON-GEOSTATIONARY SYSTEMS

Included in This Section:

This section contains planned satellite systems in orbits other than the Clarke orbit. This includes only planned systems which have no current operational satellites; planned follow-on satellites of existing systems will be found in Section 2. Operators included in this section are:

1. Asia Pacific Mobile Telecommunications Satellite Pte. Ltd. (APMT) 350
2. Constellation Communications Inc. 351
3. Globalstar Ltd. Partnership 353
4. Iridium Inc. 356
5. Mobile Communications Holdings Inc. (Ellipsat Corporation/Ellipsat International) 358
6. Odyssey Telecommunications International Inc. 360
7. Teledesic Corporation 362
8. Volunteers in Technical Assistance 364

How to Use This Section:

Satellite operators are arranged alphabetically by country, then by operator name within each country.

ASIA PACIFIC MOBILE TELECOMMUNICATIONS SATELLITE PTE. LTD. (APMT)

Singapore		Telephone:	+352 710-7251
SINGAPORE		Facsimile:	+352 710-72-53-09

Contact:

Yves Feltes, Head of Corporate Public Relations

Overview:

Plans to launch APMT 1 in February 1998 and APMT 2 in 1999.

CONSTELLATION COMMUNICATIONS INC.

One Fountain Square
11911 Freedom Drive, Suite 500
Reston, VA 20190
USA

Telephone: (703)925-0400
Facsimile: (703)925-0409

Contact:

Bruce D. Kraselsky, Chairman

Overview:

The Constellation satellite system is designed to provide seamless coverage of all points on the earth's surface. The system consists of an equatorial plane of satellite providing continuous service to tropical regions and seven inclined planes of satellites for complete global coverage. The satellites use simple frequency changing transponders to reduce technical risk and provide system flexibility. A phased growth strategy matches Constellation system capacity and capabilities with market requirements.

Proposed Services:

- Two-way mobile telephony
- Data/facsimile transmission
- Thin-route and lifeline telephone
- Dispatch voice
- Position determination and position reporting
- Data collection, distribution and control services

Status:

Filed for construction permit and frequency allocation June 3, 1991. Expected first launch: late 1999; expected operational capability: early 2000 (equatorial), 2002 (global).

CONSTELLATION SYSTEM At A Glance

Satellite name:	Constellation
Spacecraft data:	
Mass (in orbit):	500 kg
Primary power (EOL):	1,000 W
Eclipse protection:	100%
Stabilization:	3-axis
Launch date:	late 1999
Expected lifetime:	5 years
Base band processor:	24 (equatorial), 32 (global) simple frequency changing transponders in each direction (inbound and outbound)
Data transaction:	2,400 bps data/facsimile
Transponders:	
Inbound transponders:	1610 - 1626.5 MHz (receive); 6825 - 7025 MHz (transmit)
Outbound transponders:	5050 - 5252 MHz (receive); 2483.5 - 2500 MHz (transmit)
Orbital parameters:	
Number of satellites:	11 equatorial, 35 inclined-orbit, plus in-orbit spares
Altitude:	2,000 km
Inclination:	0°/62°
Orbital period:	127 minutes
Spectrum usage:	
Uplink:	1.610 - 1.6265 GHz (L-band)
Downlink:	2.4835 - 2.500 GHz (S-band)
Multiple access method:	CDMA

GLOBALSTAR LTD. PARTNERSHIP

3200 Zanker Road
P.O. Box 640670
San Jose, CA 95164-0670
USA

Telephone: (408)473-5872
Facsimile: (408)473-5548
Corporate E-mail: john.cunningham@globalstar.loral.com
Web Site Address: www.globalstar.com

Booking Contact:

Mary Lee Brewer, Manager of Marketing Communications

Contacts:

Douglas G. Dwyre, President
Anthony J. Navarra, Executive Vice President for Business Development
Robert A. Wiedeman, Vice President of Engineering

Public Relations Contact:

David C. Benton, Manager of Public Relations
John Cunningham, Manager of Public Relations

Overview:

Globalstar™ is a low earth orbit (LEO) satellite-based mobile communications system that will provide wireless voice, data, fax, and position locating service to worldwide users, beginning in 1998. It will allow calls with hand-held, vehicle-mounted and fixed-remote telephones from anywhere to anywhere and will route calls through existing public and private cellular and fixed telephone networks. Globalstar is a limited partnership formed by Loral Space and Communications Ltd. of New York, NY; Qualcomm Inc. of San Diego, CA; AirTouch Communications Inc. (formerly PacTel) of San Francisco, CA; Space Systems/Loral of Palo Alto, CA; Vodafone Group of Newbury, United Kingdom; Hyundai Electronics Industries Company, Ltd. of Seoul, Korea; Alenia of Rome, Italy; Deutsch Aerospace of Munich, Germany; France Telecom of Paris, France; Alcatel Alsthom of Paris, France; and Finmeccanica of Rome, Italy.

Proposed Services:

- Global voice, fax and data service directly to and from the PSTN
- Global voice, fax and data service connecting directly to and from various private networks
- Radio determination satellite services (RDSS) for position location and messaging

Status:

Filed for construction permit and frequency allocation June 3, 1991. In October 1994, received early start approval from the Federal Communications Commission (FCC) to permit Globalstar to expend up to $28 million to commence construction and order certain long-lead items (waiver of section 319(d) of the Communications Act). Received license to build, launch and operate the Globalstar system on January 31, 1995. Expected first launch: mid-1997; expected operational capability: mid-1998.

GLOBALSTAR™ SYSTEM At A Glance

Satellite name: Globalstar™
Spacecraft data:
Mass(in orbit): 232 kg
Stabilization: 3-axis
Launch date: August 1997
Launch vehicle: 2 launches on Delta;
3 launches on Zenit;
1 launch on Long March
Expected lifetime: 7.5 years

Orbital parameters:
Number of satellites: 48
Altitude: 759 n.m.
Inclination: 52°
Eccentricity: 0 (circular)
Orbital period: 114 minutes

Spectrum usage:
Uplink: 1.610 - 1.6255 GHz
Downlink: 2.4835 - 2.500 GHz
Multiple access method: CDMA, GSM, AMPS

Manufacturer: Space Systems/Loral

IRIDIUM INC.

1401 H Street NW
Washington, DC 20005
USA

Telephone: (202)326-5600
Facsimile: (202)842-0006
Web Site Address: www.iridium.com

Contact:

John M. Windolph, Director of Corporate Communications

Overview:

The Iridium® system will provide worldwide digital, satellite-based, cellular-personal communications for commercial service via handheld telephones, employing low-profile antennas, to individual users throughout the world.

Proposed Services:

- Voice
- Data
- Facsimile
- Paging
- RDSS

Status:

Filed for construction permit and frequency allocation December 3, 1990. Experimental license to construct and launch five satellites awarded August 1992. Waiver to construct: October 1994. The FCC awarded a license on January 31, 1995 to construct, launch and operate the 66-satellite Iridium system. Expected first launch: January 1997 (The Delta 2 failure at Cape Canaveral has put all planned Delta launches on indefinite hold. The estimated delay is between 4 and 6 months.); expected operational capability: December 1998.

IRIDIUM™ SYSTEM At A Glance

Satellite name:	Iridium®
Spacecraft data:	
Mass(in orbit):	689 kg
Stabilization:	3-axis
Launch date:	1997 (indefinite)
Launch vehicle:	Delta II rockets, each carrying five satellites, Proton rockets, each carrying seven satellites, Long March IIc rockets, each carrying two satellites
Expected lifetime:	5-8 years
Orbital parameters:	
Number of satellites:	66
Altitude:	420 n.m.
Orbital period:	100 minutes, 28 seconds
Spectrum usage:	
Uplink:	1.6 GHz
Downlink:	1.6 GHz
Multiple access method:	FDMA-TDMA

MOBILE COMMUNICATIONS HOLDINGS INC.
(ELLIPSAT CORPORATION/ELLIPSAT INTERNATIONAL)

1120 19th Street NW, Suite 480
Washington, DC 20036
USA

Telephone: (202)466-4488
Facsimile: (202)466-4493

Contact:

David Castiel, Chairman and Chief Executive Officer

Overview:

The Ellipso™ system will consist of up to 16 satellites in elliptical orbits. They will be deployed in two constellations: Borealis over the northern hemisphere and Concordia in equatorial orbit. The combination ensures continuous coverage of the United States and the rest of the world.

Proposed Services:

- Will provide global voice and data services, complementing existing cellular systems and offering access to unserved and remote areas.

Status:

Filed for construction permit and frequency allocation on November 5, 1990, for the first six satellites. Filed June 3, 1991, for another 18 satellites. Experimental license was granted on August 5, 1992. Filed for a 16 satellite system in response to FCC report in order: November 16, 1994. Expected to construct and launch license: January 31, 1995. Expected operational capability: end of 1997.

Satellite Control Stations:

TT&C stations: 2 (Conus)

ELLIPSO™ SYSTEM At A Glance

- Satellite name: .... Ellipso™
- Spacecraft data:
  - Mass(in orbit): .... 650 kg
  - Eclipse protection: .... All transponders
  - Stabilization: .... Reaction wheel and propulsion
  - Launch date: .... June 1997
  - Expected lifetime: .... 5 years
  - Orbital parameters:
    - Number of satellites: .... 14 + 2 in orbit spares
    - Altitude: .... 7,846/520 km
    - Apogee: .... 7,846 km
    - Perigee: .... 520 km
    - Inclination: 116.565
    - Eccentricity: .... 0.346°
    - Orbital period: .... 3 hours
  - Spectrum usage:
    - Uplink: .... 1.610 - 1.6265 GHz
    - Downlink: .... 2.4835 - 2.500 GHz
    - Multiple access method: .... FDMA, CDMA

ODYSSEY TELECOMMUNICATIONS INTERNATIONAL INC.

One Space Park
E2/5000
Redondo Beach, CA 90278
USA

Telephone: (310)814-8888
Facsimile: (310)814-1400
Web Site Address: www.trw.com

1000 Rue de la Gauchetiere West
Montreal, PQ H3B 4X5
CANADA

Telephone: (514)868-8000
Facsimile: (514)868-8080

Contacts:

Peter Stenzel, Vice President of Corporate Development, (310)812-8319
Don Falls, Vice President of Marketing, (514)868-8082

Public Relations Contact:

Jack Prichett, Public Relations Manager, (310)812-5227

Overview:

The Odyssey communications satellite system will provide global, satellite-based cellular personal communications services, including voice, fax, data, and short message services. The system will consist of twelve medium earth orbit satellites, seven earth stations and fixed and mobile wireless terminals.

Proposed Services:

- Global, satellite-based personal communications services, including voice, fax, data, and short messages

Status:

Filed for construction permit and frequency allocation June 3,1991. FCC license to build and operate awarded January 1995. Expected first launch: 2000; expected operational capability: 2001.

Satellite Control Network:

Seven ground stations, plus system operations center

ODYSSEY SYSTEM At A Glance

Satellite name: Odyssey

Spacecraft data:

- Mass(in orbit): 2,200 kg
- Primary power (EOL): 6,000 W
- Eclipse protection: All transponders
- Stabilization: 3-axis
- Launch date: 2000
- Expected lifetime: 15 years

Orbital parameters:

- Number of satellites: 12
- Altitude: 5,600 n.m.
- Inclination: 50°
- Orbital period: 6 hours

Spectrum usage:

- Uplink: 1.610 - 1.62135 GHz
- Downlink: 2.4835 - 2.500 GHz
- Multiple access method: CDMA

Manufacturer: TRW

TELEDESIC CORPORATION

2300 Carillon Point
Kirkland, WA 98033
USA

Telephone: (206)803-1400
Facsimile: (206)803-1404
Web Site Address: www.teledesic.com

Contact:

Lawrence H. Williams, Director of External Affairs,
1150 Connecticut Avenue NW, Suite 200, Washington, DC 20036
(202)296-8047, facsimile: (202)296-8953, E-mail: larry@teledesic.com

Overview:

Utilizing a constellation of several low-Earth-orbit satellites, Teledesic will enable access to advanced information services to institutions and individuals anywhere in the world.

Services Proposed:

- Voice
- Data
- Fax
- Paging
- Video

Status:

Application filed with the FCC on March 21, 1994. The FCC awarded a license on March 14, 1997 to build its 840 satellite system. Expected first launch: 2000.

TELEDESIC SYSTEM At A Glance

Satellite name:	Teledesic
Spacecraft data:	
Area of coverage:	Nearly global (2 degree hole at each pole)
Mass (orbit):	800 kg
Primary power (EOL):	6.6 kw
Eclipse protection:	Yes
Stabilization:	3-axis
Launch date:	2000-2001
Expected lifetime:	10 years
Orbital parameters:	
Number of satellites:	840 (plus spares)
Altitude:	700 km
Inclination:	98.2°
Orbital period:	100 minutes
Eccentricity:	0
Perigee:	700 km
Spectrum usage:	
Uplink:	28.6 to 29.1 GHz
Downlink:	18.8 to 19.3 GHz
Multiple access method:	TDMA, FDMA

VOLUNTEERS IN TECHNICAL ASSISTANCE

1600 Wilson Boulevard, Suite 500
Arlington, VA 22209
USA

Telephone:	(703)276-1800
Facsimile:	(703)243-1865
Corporate E-mail:	vita@vita.org
Web Site Address:	www.vita.org

Contacts:

Henry R. Norman, President
Eric Rosenberg, SatelliteTechnical Manager

Public Relations Contact:

Joseph F. Sedlak, Director of Government Relations

Overview:

Volunteers in Technical Assistance (VITA) is an international non-profit development organization. The Vitasat system will provide essential educational, health, environmental, disaster relief, and fundamental technical assistance communications services for the benefit of recipients in developing countries.

Proposed Services:

- Will support direct terminal-to-terminal network operations without the use of large, expensive gateway stations
- Data messaging (store and forward)
- Remote data acquisition

Status:

Filed for construction permit and frequency allocation September 20, 1990. Prototype launched in 1990. Twenty-four earth stations using it as of July 1, 1995. Operational satellite scheduled for launch in 1997.

Satellite Control Network:

TT&C stations:	Logan, Utah

VITASAT SYSTEM At A Glance

Satellite name: Vitasat
Spacecraft data:
- Mass(in orbit): 90 kg
- Stabilization: Gravity gradient boom
- Launch date: 1997
- Launch vehicle: Cosmos
- Expected lifetime: 5 years

Orbital parameters:
- Number of satellites: 2
- Altitude: 1,000 km (600 miles)
- Apogee: 670 km
- Perigee: 670 km
- Inclination: 83°
- Eccentricity: 0.0013232
- Orbital period: 105 minutes

Spectrum usage:
- Uplink: 148.00 - 149.00 MHz
- Downlink: 400.0 - 401.0 MHz
- Multiple access method: FDMA, TDMA

Manufacturer: CTA Corporation

SECTION 5

INTERNATIONAL AND REGIONAL NETWORKS

Included in This Section:

This section contains existing, follow-on and planned international and regional commercial communications satellite systems in the geosynchronous orbit. Consortiums included are:

Operational Regional Networks

Arabsat (Arab Satellite Communications Organization) 370
Asia Satellite Telecommunications Company Ltd. (Asiasat) 380
Eutelsat (European Telecommunications Satellite Organization) 397
Societe Europeenne des Satellites (SES) 417
Turk Telecom — Satcom Department 429

Operational International Networks

Columbia Communications Corporation 434
Inmarsat (International Mobile Satellite Organization) 440
Intelsat (International Telecommunications Satellite Organization) 447
Intersputnik (International Organization of Space Communications) 478
Orion Atlantic, L.P. 490
Panamsat 501

Planned International and Regional Networks

Asia Broadcasting and Communications Network Plc. 522
European Space Agency (ESA) 524
Friendly Islands Satellite Communications Ltd. (Tongasat) 526

How to Use This Section:

Networks are organized by sub-section and listed alphabetically by operator name.

OPERATIONAL REGIONAL NETWORKS

ARABSAT
(ARAB SATELLITE COMMUNICATIONS ORGANIZATION)

P.O. Box 1038
Riyadh 11431
SAUDI ARABIA

Telephone: +966 1-464-6666
Facsimile: +966 1-465-6983
Telex: 966-201300 ARABSAT SJ
Web Site Address: www.arabsat.com
Corporate E-mail: arabsat@arab.net

Booking Contacts:

Nabil A. Shanti, Director of Operations & Marketing
Saad Al Bidnah, Director General

Contact:

Saad bin Abdul-Aziz al Bedna, Director General

Overview:

Operates the Arabsat system, a regional satellite system serving its 20 member countries. The organization was formed in 1976. Its first two satellites (Arabsat 1A and 1B) were launched in 1985 and retired in 1992. To provide additional and back-up capacity to Arabsat 1C (launched 1992), Anik D2 was purchased from Telesat Canada and moved to 20ºE. The first Arabsat 2 satellite, 2A, was launched in July 1996. The second satellite of the second generation, 2B, was launched in November 1996 and will be ready for operation in the beginning of 1997. A third satellite, 2C, will be manufactured and launched to be collocated with Arabsat 2A in 1998. All transponders of this satellite are in the Ku-band.

Services Offered:

- Public regional and domestic telephony and telecommunications
- Data
- Television
- Radio
- Videoconferencing

Terrestrial Network:

Ground control stations: Dirab (Riyadh), Saudi Arabia; Tunis, Tunisia

Earth stations: Algeria, Bahrain, Djibouti, Iraq, Jordan, Kuwait, Mauritania,Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen

Arabsat Member Countries

Country	Investment Share %
Algeria	1.72
Bahrain	2.45
Djibouti	0.12
Egypt	1.59
Iraq	1.90
Jordan	4.05
Kuwait	14.59
Lebanon	3.83
Libya	11.28
Mauritania	0.27
Morocco	0.61
Oman	1.23
Palestine	0.25
Qatar	9.81
Saudi Arabia	36.66
Somalia	0.24
Sudan	0.27
Syria	2.08
Tunisia	0.74
United Arab Emirates	4.66
Yemen	1.65

ARABSAT 1C SYSTEM At A Glance

Satellite name: .... Arabsat 1C, 31°E*
Spacecraft data:
  Mass (in orbit, BOL): .... 780 kg
  Stabilization: 3-axis
  Primary power (EOL): .... 1,300 W
  Eclipse protection: .... S-band off
  Stabilization: .... 3-axis, body-stabilized
  Launch date: .... February 1992
  Launch vehicle: .... Ariane 44L
  Expected lifetime: .... 7 years

  Transponders:
    Number: .... 25 C-band, 1 C-/S-band
    Power output: .... C-band: 14 x 15 W SSPA, BW 12 x 36 MHz, EIRP 35 dBW; 8 x 57 W TWTA, BW 36 MHz, EIRP 41 dBW; Ku-band: 12 x 90 W TWTA, BW 8 x 36 and 4 x 30 MHz, EIRP 47 dBW to 43 dBW
    Polarization: .... 12 C-band: RHCP; 13 C-band: LHCP; 1 S-band: linear
    G/T: .... -6, -9 dB/K (C-band); 0, -4 dB/K (Ku-band)

  Single carrier saturation flux density: .... -93 dBW/m^2 to -75 dBW/m^2

  Manufacturer: .... Aerospatiale, France

* To be relocated to 20°E in 1997.

Arabsat 1 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1A	Linear	33	41	5.925	2.540
1B	Linear	33	41	6.425	2.655
2	LHCP	33	31	5.962	3.737
3	RHCP	33	31	5.980	3.755
4	LHCP	33	31	5.999	3.774
5	RHCP	33	31	6.017	3.792
6	LHCP	33	31	6.036	3.811
7	RHCP	33	31	6.054	3.829
8	LHCP	33	31	6.073	3.848
9	RHCP	33	31	6.091	3.866
10	LHCP	33	31	6.110	3.885
11	RHCP	33	31	6.128	3.903
12	LHCP	33	31	6.141	3.922
13	RHCP	33	31	6.165	3.940
14	LHCP	33	31	6.184	3.959
15	RHCP	33	31	6.202	3.977
16	LHCP	33	31	6.221	3.996
17	RHCP	33	31	6.239	4.014
18	LHCP	33	31	6.258	4.033
19	RHCP	33	31	6.276	4.051
20	LHCP	33	31	6.295	4.070
21	RHCP	33	31	6.313	4.088
22	LHCP	33	31	6.332	4.107
23	RHCP	33	31	6.350	4.107
24	LHCP	33	31	6.369	4.144
25	RHCP	33	31	6.387	4.162
26	LHCP	33	31	6.406	4.181

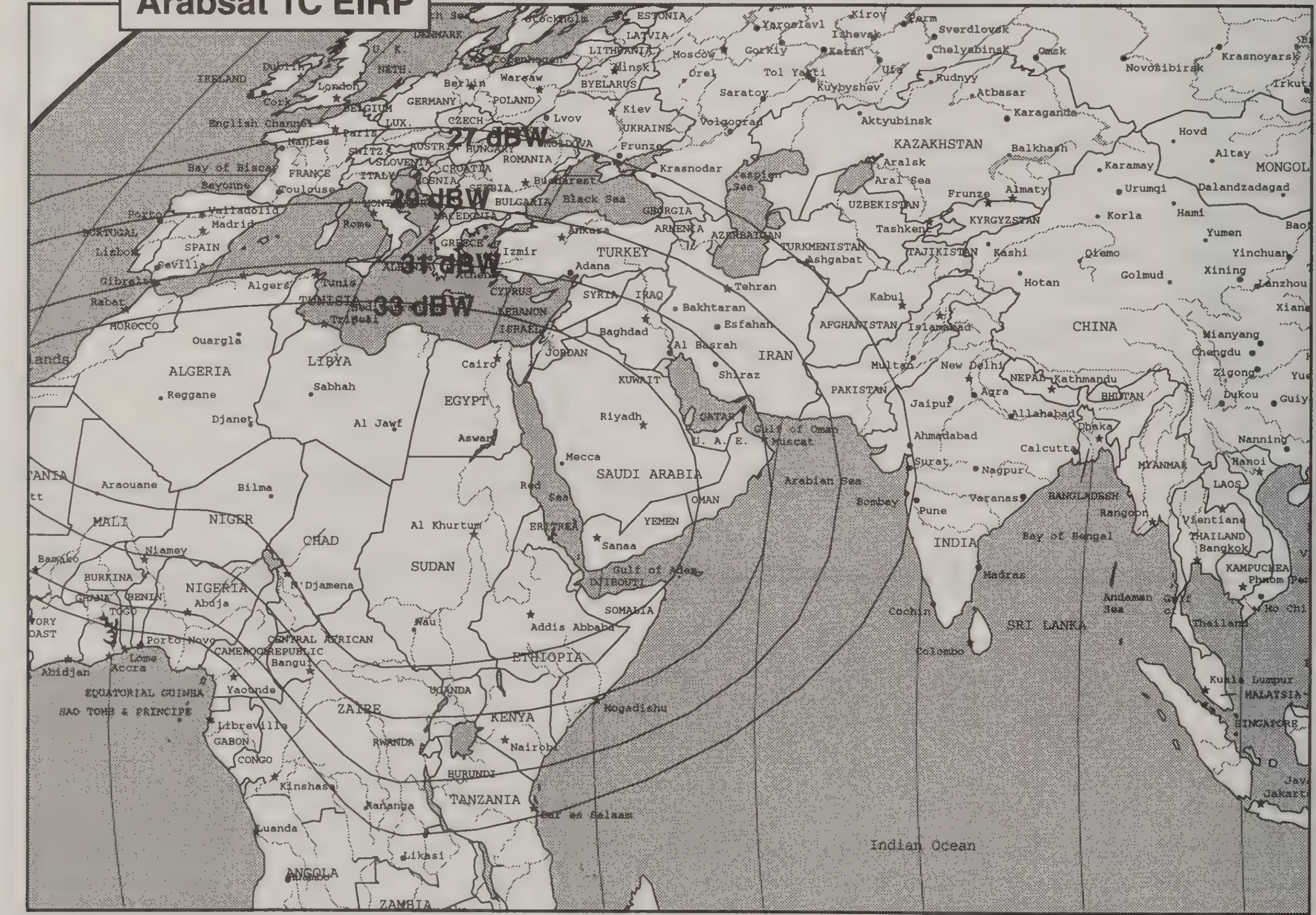
Arabsat 1C

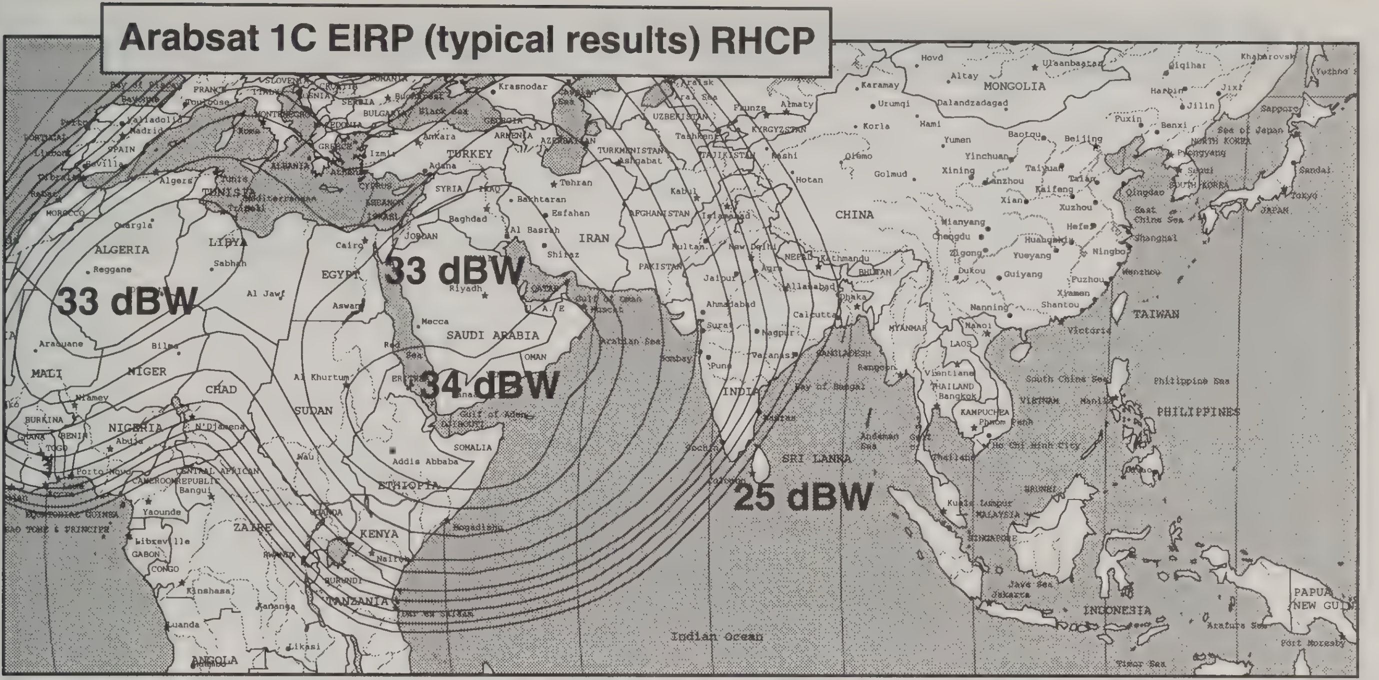
Orbital location:	31°E
Launch:	February 1992, Ariane 4
Expected lifetime:	7 years (expected to exceed)
Expected end of life:	2002

Antennas beam coverage overview:

C-band, S-band:	Arab League Nations, South Europe, Asia and Africa

Arabsat 1C EIRP




Arabsat 1C EIRP (typical results) RHCP

ARABSAT 2 SYSTEM At A Glance

Satellite name:	Arabsat 2A, 26°E; Arabsat 2B, 32°E; Arabsat 2C, 26°E (collocated with 2A) [to be launched]
Spacecraft data:	
Mass (in orbit, BOL):	1,540 kg
Stabilization:	3-axis
Primary power (EOL):	5,000W
Eclipse protection:	Yes
Launch date:	July 9, 1996 (2A); November 13, 1996 (2B); end of 1998 (2C)
Launch vehicle:	Ariane 4 (2A, 2B)
Expected lifetime:	12 years
Transponders:	
Number	22 (C-band), 12 (Ku-band) (2A, 2B); 20 (2C)
Power output:	C-band: 14 x 13W SSPA, BW 12 x 36 MHz, EIRP 35 dBW; 8 x 50W TWTA, BW 36 MHz, EIRP 41dBW; Ku-band: 12 x 90W TWTA. BW 8 x 36 and 4 x 30 MHz, EIRP 47 dBW.
Polarization:	(C-band) circular; (Ku-band) linear
G/T:	-7.5 dB/K (2A, 2B); 0, -4 dB/K (2C)
Broadcast frequencies:	4 GHz & 2.5 GHz
Single carrier saturation flux density:	-84 to -75 dBW/m^2 (2A, 2B); -93 dBW/m^2 to 75 dBW/m^2
Manufacturer:	Aerospatiale (prime) Alcatel (payload)

Arabsat 2A Transponder Frequency Plan

Tr.#	Pol.	Uplink(GHz)	Downlink(GHz)
Ku-band			
1	V (up), H(down)	13.76500	12.51800
2	H (up), V (down)	13.78300	12.53600
3	V (up), H(down)	13.80977	12.56277
4	H (up), V (down)	13.82477	12.57777
5	V (up), H(down)	13.58153	12.60453
6	H (up), V (down)	13.86653	12.61953
7	V (up), H(down)	13.89330	12.64630
8	H (up), V (down)	13.90830	12.66130
9	V (up), H(down)	13.93206	12.68506
10	H (up), V (down)	13.94706	12.70006
11	V (up), H(down)	13.96700	12.72000
12	H (up), V (down)	13.98200	12.73500
C-band (High power)			
15	LHCP/RHCP	6.26875	4.04375
16	RHCP/LHCP	6.27800	4.05300
17	LHCP/RHCP	6.30975	4.08475
18	RHCP/LHCP	6.32350	4.09850
19	LHCP/RHCP	6.35075	4.12575
20	RHCP/LHCP	6.36450	4.13950
21	LHCP/RHCP	6.39175	4.16675
22	RHCP/LHCP	6.40550	4.18050
C-band (Medium power)			
1	LHCP/RHCP	5.94525	3.72025
2	RHCP/LHCP	5.96575	3.74075
3	LHCP/RHCP	5.98625	3.76125
4	RHCP/LHCP	6.00675	3.78175
5	LHCP/RHCP	6.02725	3.80225
6	RHCP/LHCP	6.04775	3.82275
7	LHCP/RHCP	6.06825	3.84325
8	RHCP/LHCP	6.08875	3.86375
9	LHCP/RHCP	6.10925	3.88425
10	RHCP/LHCP	6.12975	3.90475
11	LHCP/RHCP	6.15025	3.92525
12	RHCP/LHCP	6.17075	3.94575
13	LHCP/RHCP	6.21425	3.98925
14	RHCP/LHCP	6.21025	3.98525

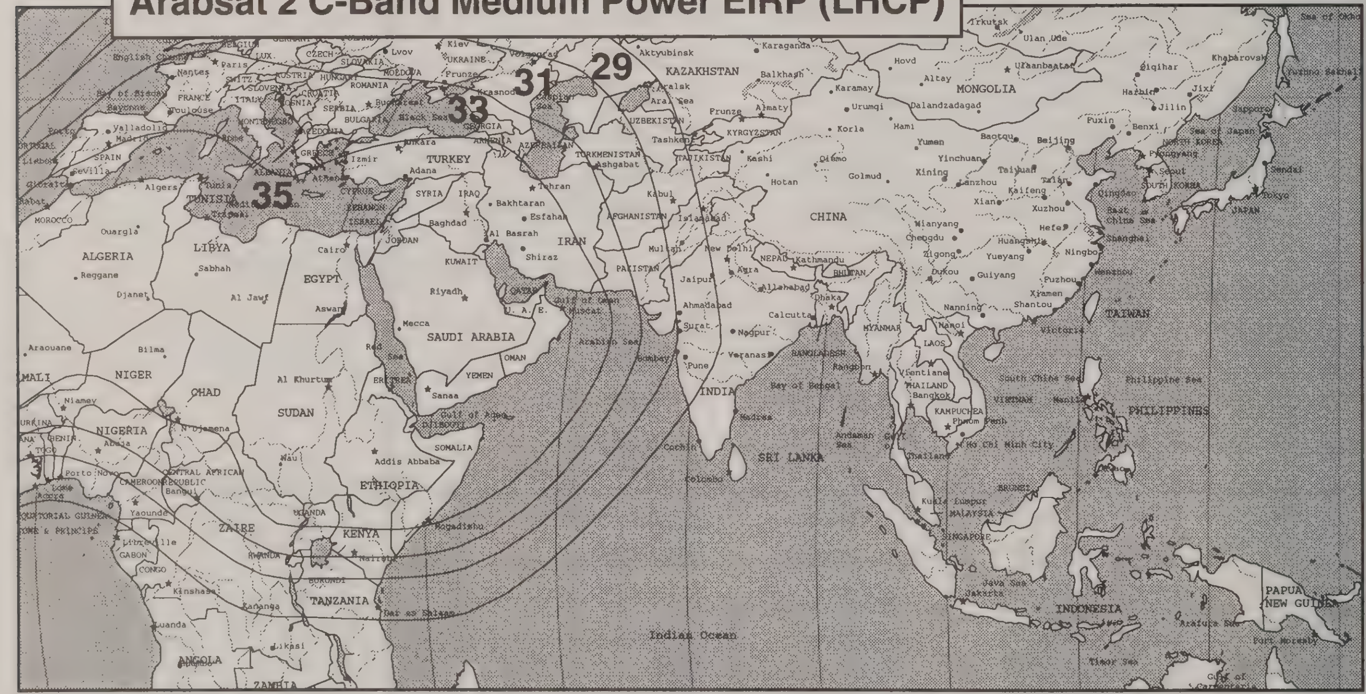
Arabsat 2

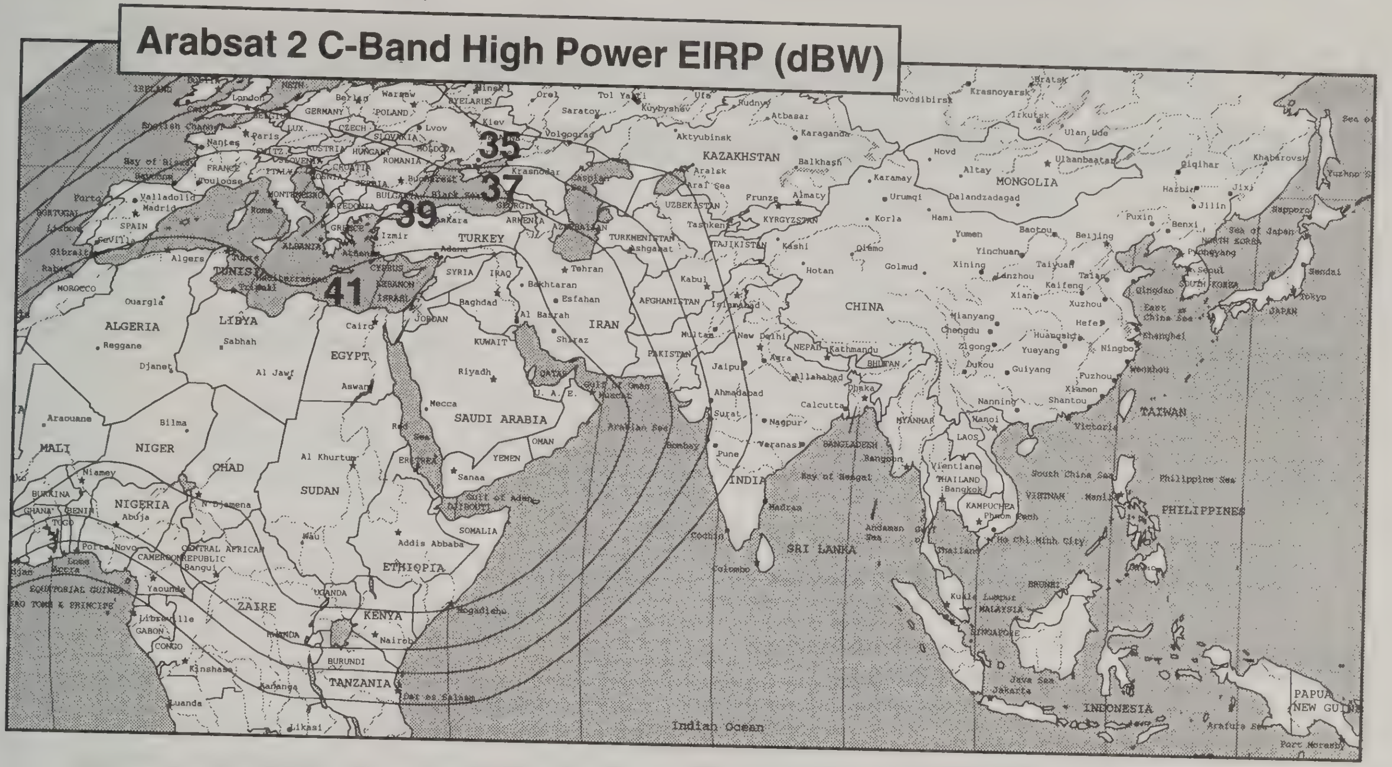
Orbital location:	26°E (2A); 30.5°E (2B); 26°E (2C)
Launch:	July 9, 1996, Ariane 4 (2A); November 13, 1996, Ariane 4 (2B); end of 1998 (2C)
Expected lifetime:	12 years (expected to exceed)
Expected end of life:	2012 (2A, 2B)

Antennas beam coverage overview:

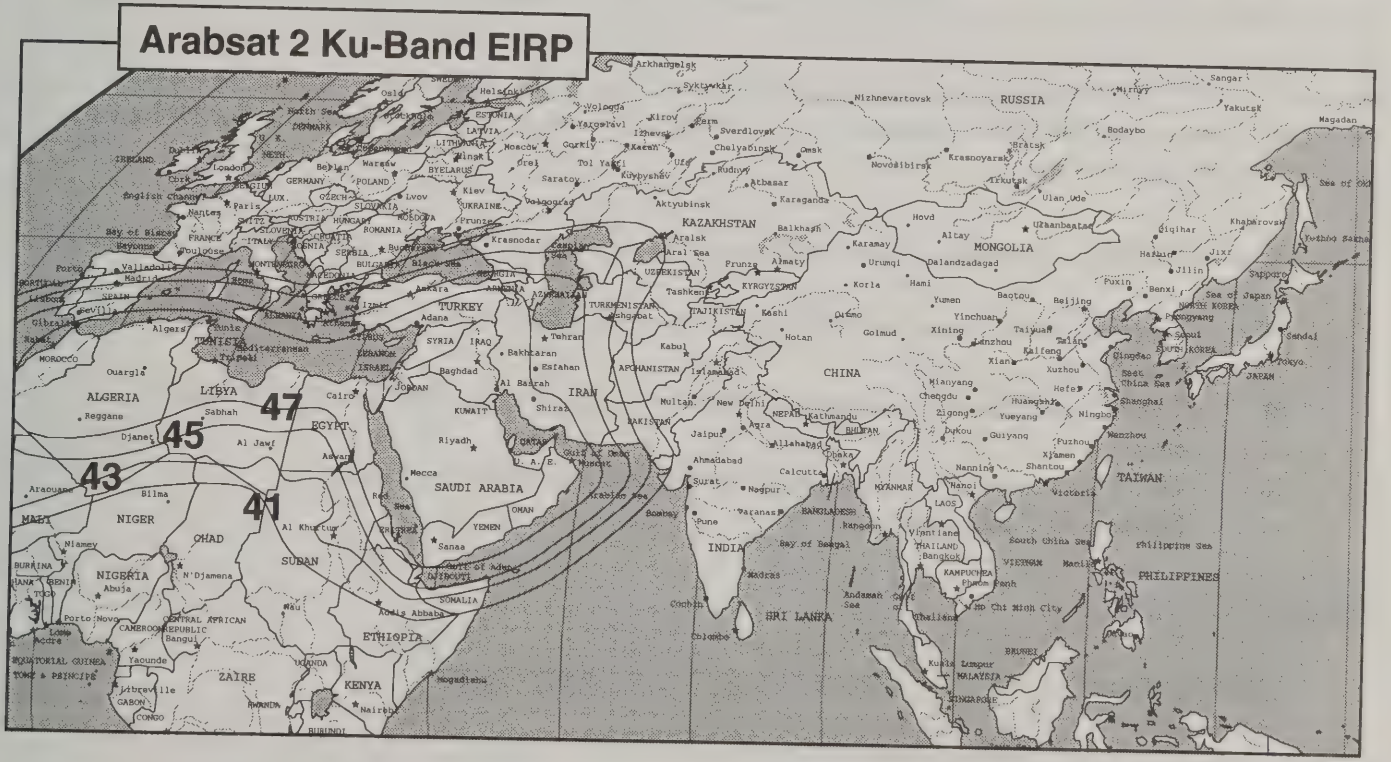
Ku-band:	Arab League Nations, South Europe and Asia (2A, 2B) Arab countries, South Europe (2C)
C-band:	Arab League Nations, South Europe, Asia, Africa, and United Kingdom

Arabsat 2 C-Band Medium Power EIRP (LHCP)





Arabsat 2 C-Band High Power EIRP (dBW)



Arabsat 2 Ku-Band EIRP

ASIA SATELLITE TELECOMMUNICATIONS COMPANY LIMITED (ASIASAT)

23-24/F East Exchange Tower
38-40 Leighton Road
Causeway Bay
HONG KONG

Telephone:	2805-6666
Facsimile:	2504-3875
Telex:	68345 ASAT HX

Contact:

Sabrina Cubbon, General Manager of Marketing
Winnie Pang, Corporate Affairs Manager

Overview:

Owns and operates AsiaSat 1, the first privately owned regional satellite designed for shared domestic services by Asian countries. AsiaSat 2, which provides three times the power and twice the coverage of AsiaSat 1, was launched on November 28, 1995 to 100.5ºE. The company is also building its third satellite, AsiaSat 3, for launch in late 1997. It is planning its fourth satellite, AsiaSat 4, to be launched in 1999 when AsiaSat 1 reaches the end of its life expectancy. AsiaSat is a wholly owned subsidiary of Asia Satellite Telecommunications Holding Limited which is listed on both the Hong Kong and New York Stock Exchanges.

Services Offered:

- National and regional television, domestic voice, data telecommunications, and radio broadcasts
- Trunk-route telecommunications: multiple voice and data circuits between major cities
- Thin-route telecommunications: rural telephony or private networks
- Point-to-multipoint services

Satellite Control:

TT&C stations:	Stanley Earth Station, Hong Kong

ASIASAT 1 SYSTEM At A Glance

Satellite name:	AsiaSat 1, 105.5°E
Spacecraft data:	
Mass (in orbit):	654 kg
Stabilization:	Spin
Eclipse protection:	All transponders
Primary power (EOL):	668 W (summer solstice); 748 W (autumn equinox)
Launch date:	April 7, 1990
Launch vehicle:	Long March 3
Expected lifetime:	9-10 years
Transponders:	
Number:	24 C-band
Power output:	8.2 W TWTA
Polarization:	Dual linear
Bandwidth:	24 C-band @ 36 MHz
Uplink frequency:	5.925 - 6.425 GHz (C-band)
Downlink frequency:	3.7 - 4.2 GHz (C-band)
EIRP:	37 dBW (C-band)
Satellite receiving G/T:	3.0 dB/K
Redundancy:	4:2
Single carrier saturation flux density:	-81 to -90 dBW/sq.m.
Manufacturer:	Hughes

AsiaSat 1 Transponder Frequency Plan

Tr.#	Pol.*	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
NORTHERN					
1	Linear	36	37	5.945	3.720
2	Linear	36	37	5.985	3.760
3	Linear	36	37	6.025	3.800
4	Linear	36	37	6.065	3.840
5	Linear	36	37	6.105	3.880
6	Linear	36	37	6.145	3.920
7	Linear	36	37	6.185	3.960
8	Linear	36	37	6.225	4.000
9	Linear	36	37	6.265	4.040
10	Linear	36	37	6.305	4.080
11	Linear	36	37	6.345	4.120
12	Linear	36	37	6.385	4.160
SOUTHERN					
1	Linear	36	37	5.965	3.740
2	Linear	36	37	6.005	3.780
3	Linear	36	37	6.045	3.820
4	Linear	36	37	6.085	3.860
5	Linear	36	37	6.125	3.900
6	Linear	36	37	6.165	3.940
7	Linear	36	37	6.205	3.980
8	Linear	36	37	6.245	4.020
9	Linear	36	37	6.285	4.060
10	Linear	36	37	6.325	4.100
11	Linear	36	37	6.365	4.140
12	Linear	36	37	6.405	4.180

*The polarization is vertical for uplink Northern and downlink Southern.
The polarization is horizontal for uplink Southern and downlink Northern

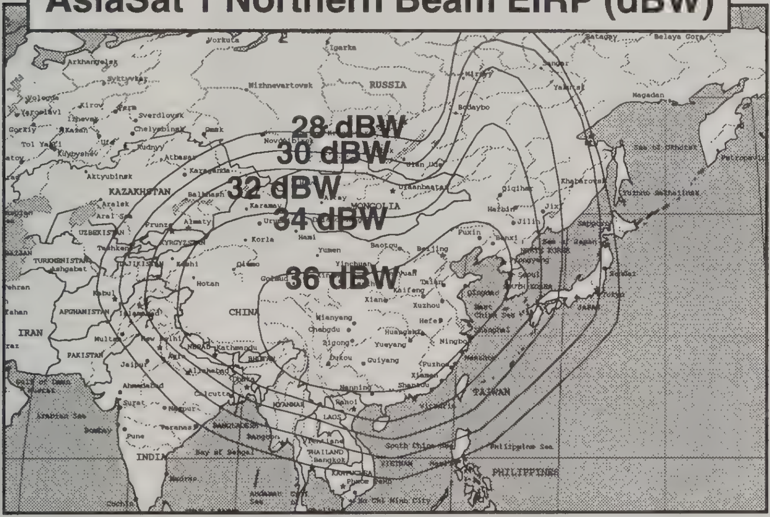
AsiaSat 1

Orbital location:	105.5°E
Launch:	April 7, 1990, Long March 3
Expected lifetime:	9-10 years
Expected end of life:	1999-2000

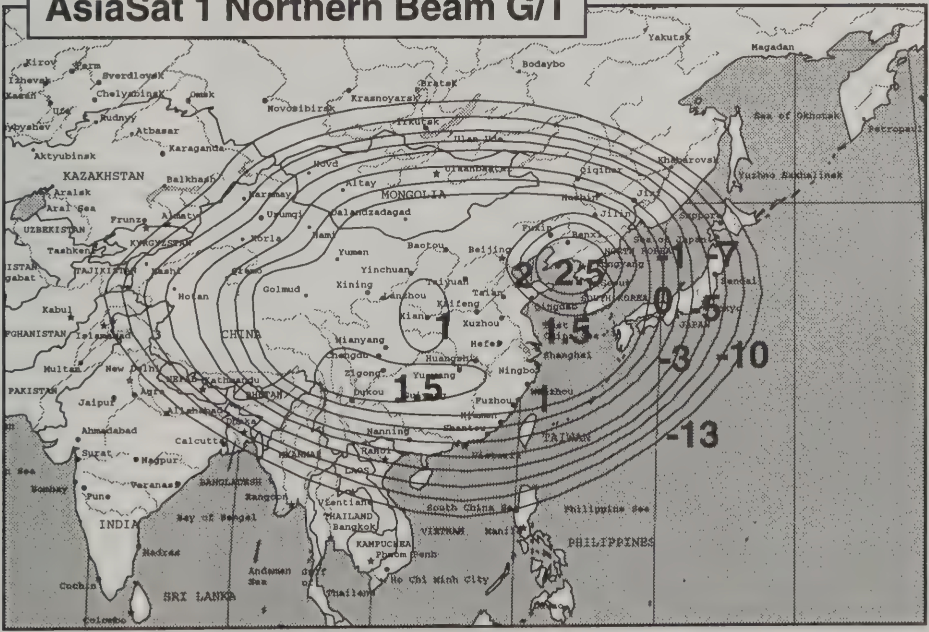
Antennas beam coverage overview:

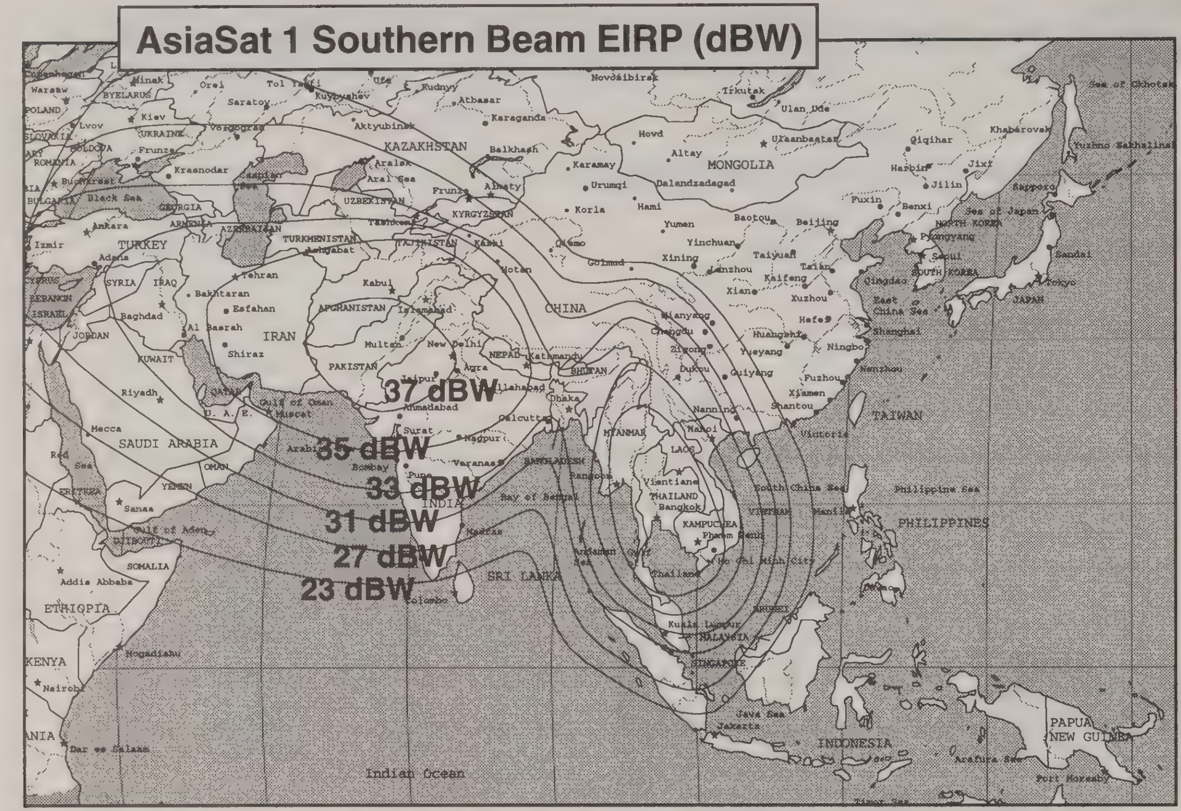
C-band:	Asia and the Middle East

AsiaSat 1 Northern Beam EIRP (dBW)

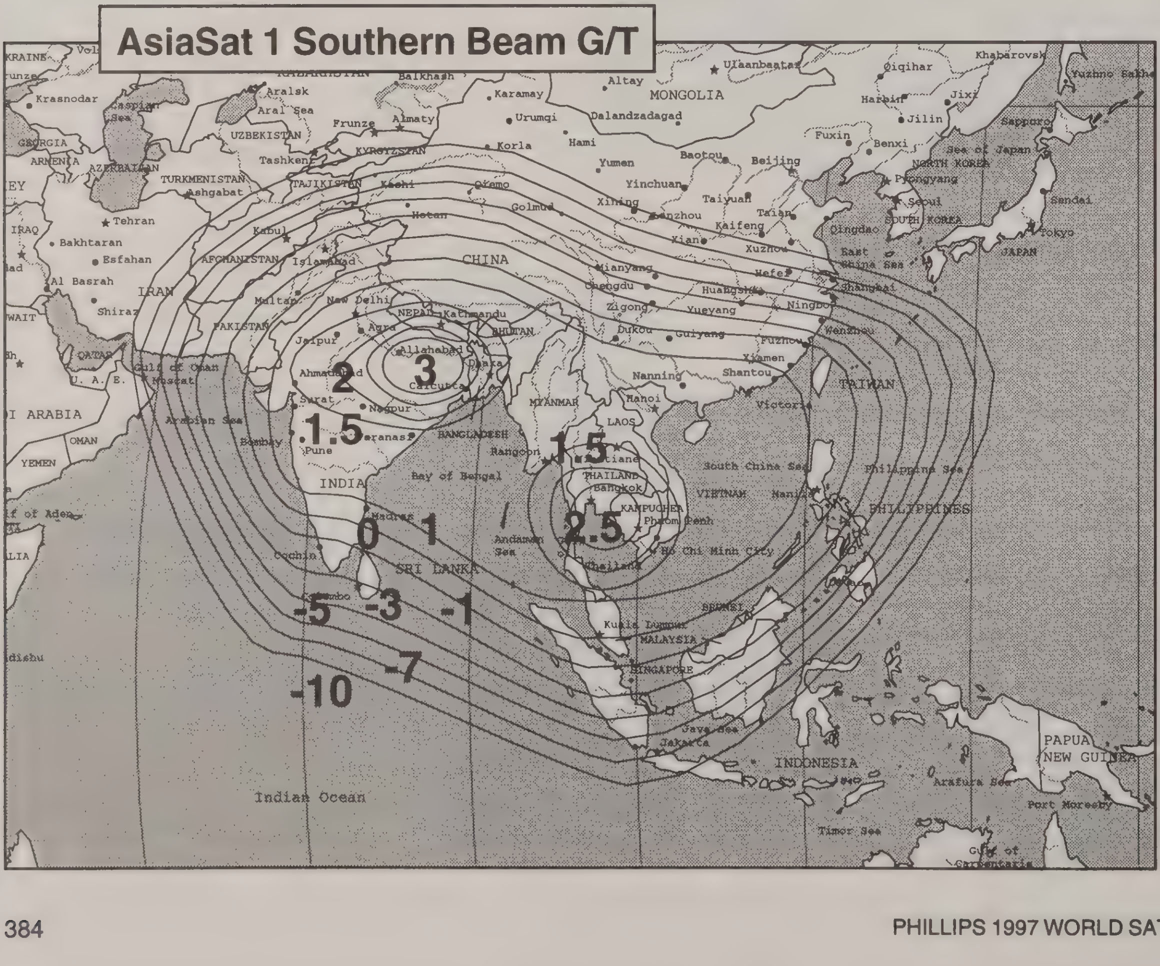


AsiaSat 1 Northern Beam G/T





AsiaSat 1 Southern Beam EIRP (dBW)



AsiaSat 1 Southern Beam G/T

ASIASAT 2 SYSTEM At A Glance

Satellite name:	AsiaSat 2,100.5°E
Spacecraft data:	
Mass (in orbit):	1,830 kg
Stabilization:	3-axis body-stabilized
Eclipse protection:	All transponders
Primary power (EOL):	5,050 W (summer solstice); 5,500 W (autumn equinox)
Launch date:	November 28, 1995
Launch vehicle:	Long March 2E
Expected lifetime:	13 years
Transponders:	
Number:	24 C-band, 9 Ku-band
Power output:	55 W TWTA (C-band); 115 W TWTA (Ku-band)
Polarization:	Dual linear
Redundancy:	2 groups 16:12 (C-band); 12:9 (Ku-band)
Bandwidth:	20 C-band @ 36 MHz; 4 C-band @ 72 MHz; 9 Ku-band @ 54 MHz
Uplink frequency:	5.845 - 6.425 GHz (C-band), 14.0 - 14.3 GHz (Ku-band)
Downlink frequency:	3.62 - 4.2 GHz (C-band), 12.2 - 12.5 GHz (Ku-band)
EIRP:	40 dBW (C-band), 53 dBW (Ku-band)
Satellite receiving G/T:	0 dB/K maximum (C-band); 6 dB/K maximum (Ku-band)
Single carrier saturation flux density:	-97 ± 1 dBW/m^2 maximum
Manufacturer:	Lockheed Martin Astro Space

AsiaSat 2 C-Band Transponder Frequency Plan

Tr.#	Pol.*	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1A	Linear	36	40	5.885	3.660
1B	Linear	36	40	5.865	3.640
2A	Linear	36	40	5.925	3.700
2B	Linear	36	40	5.905	3.680
3A	Linear	36	40	5.965	3.740
3B	Linear	36	40	5.945	3.720
4A	Linear	36	40	6.005	3.780
4B	Linear	36	40	5.985	3.760
5A	Linear	36	40	6.045	3.820
5B	Linear	36	40	6.025	3.800
6A	Linear	36	40	6.085	3.860
6B	Linear	36	40	6.065	3.840
7A	Linear	36	40	6.125	3.900
7B	Linear	36	40	6.105	3.880
8A	Linear	36	40	6.165	3.940
8B	Linear	36	40	6.145	3.920
9A	Linear	36	40	6.205	3.980
9B	Linear	36	40	6.185	3.960
10A	Linear	36	40	6.245	4.020
10B	Linear	36	40	6.225	4.000
11A	Linear	72	40	6.305	4.080
11B	Linear	72	40	6.285	4.060
12A	Linear	36	40	6.385	4.160
12B	Linear	36	40	6.365	4.140

*The polarization is vertical for downlink "A" and uplink "B."
The polarization is horizontal for uplink "A" and downlink "B."

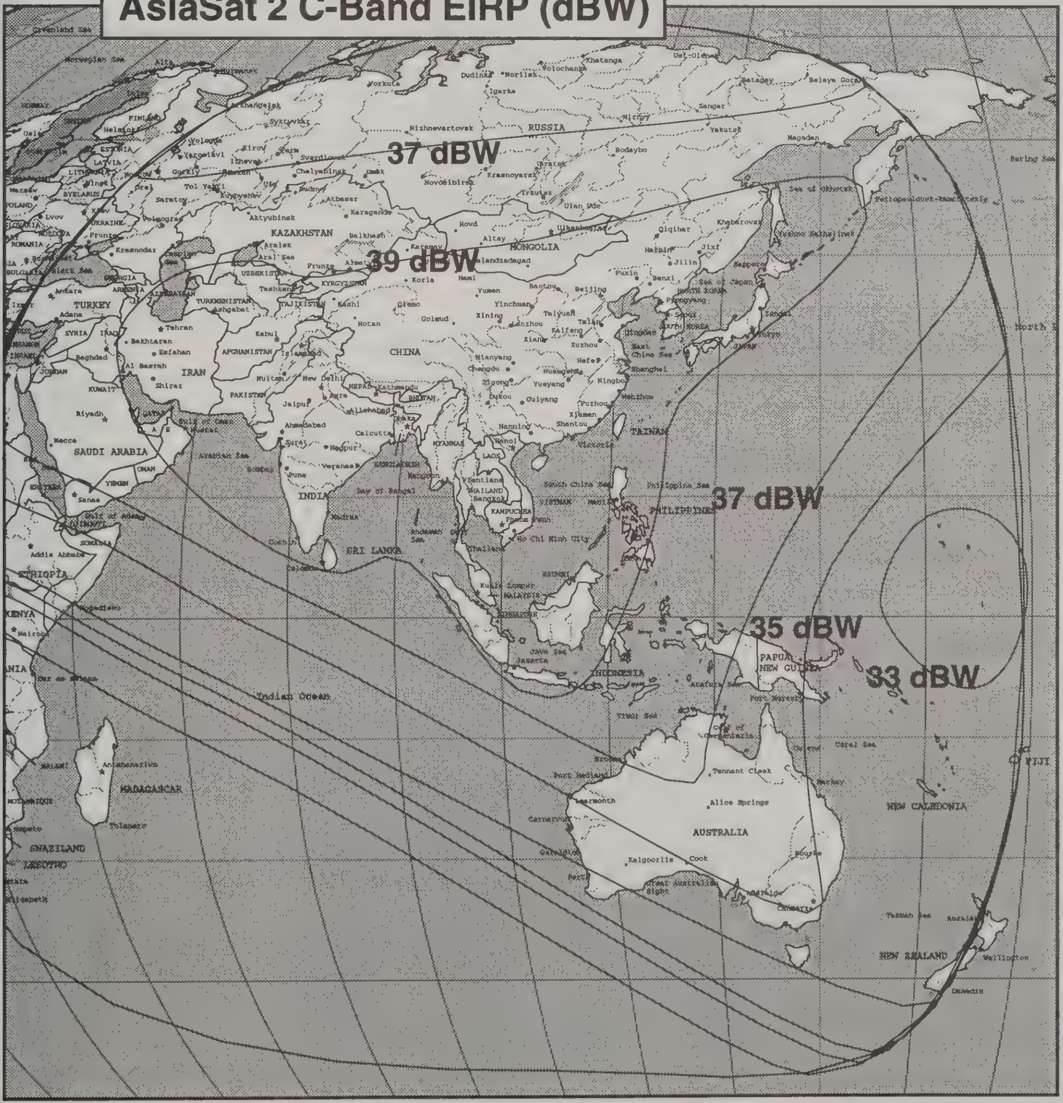
AsiaSat 2

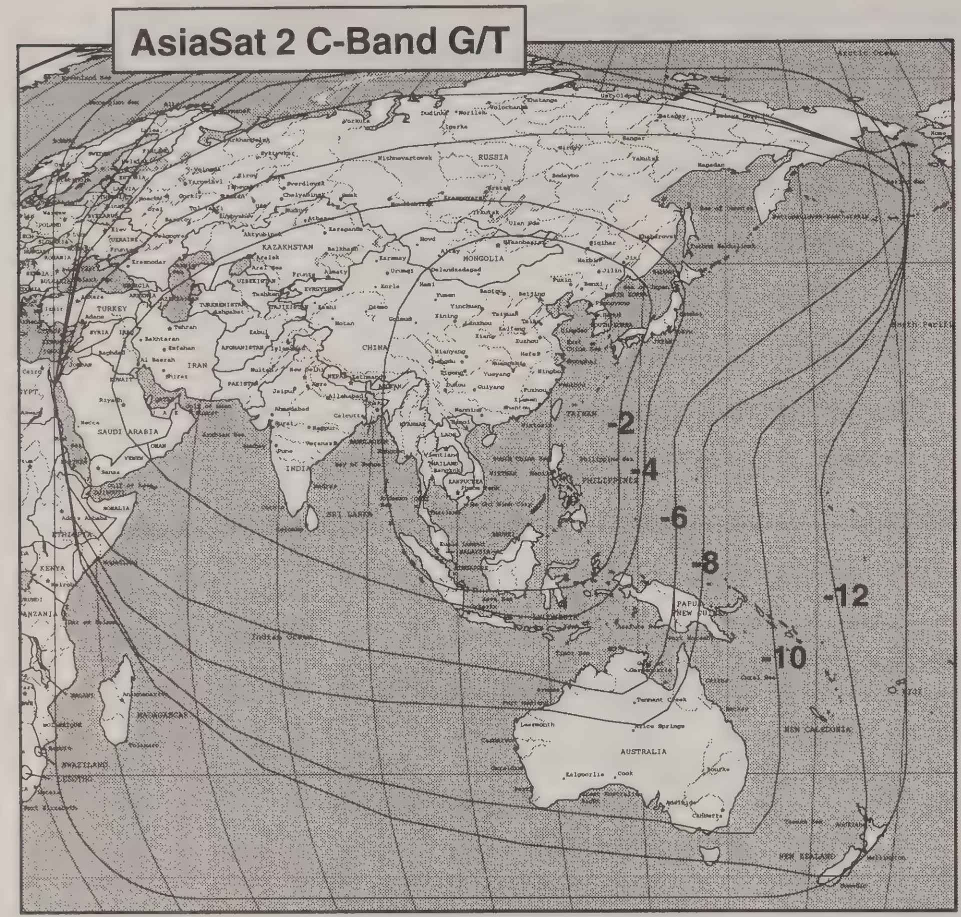
Orbital location:	100.5°E
Launch:	November 28, 1995, Long March 2E
Expected lifetime:	13 years
Expected end of life:	2008

Antennas beam coverage overview:

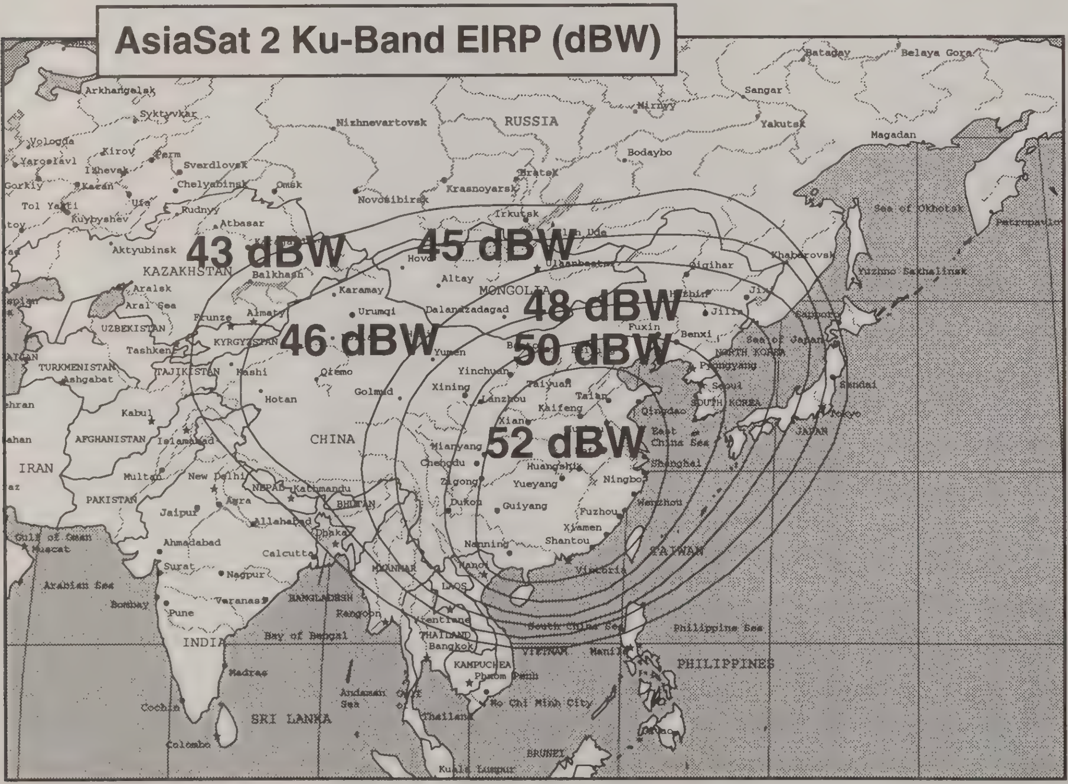
C-band:	Asia, Middle East, Eastern Europe, C.I.S., Australia
Ku-band:	China, Hong Kong, Taiwan, Korea, Japan

AsiaSat 2 C-Band EIRP (dBW)



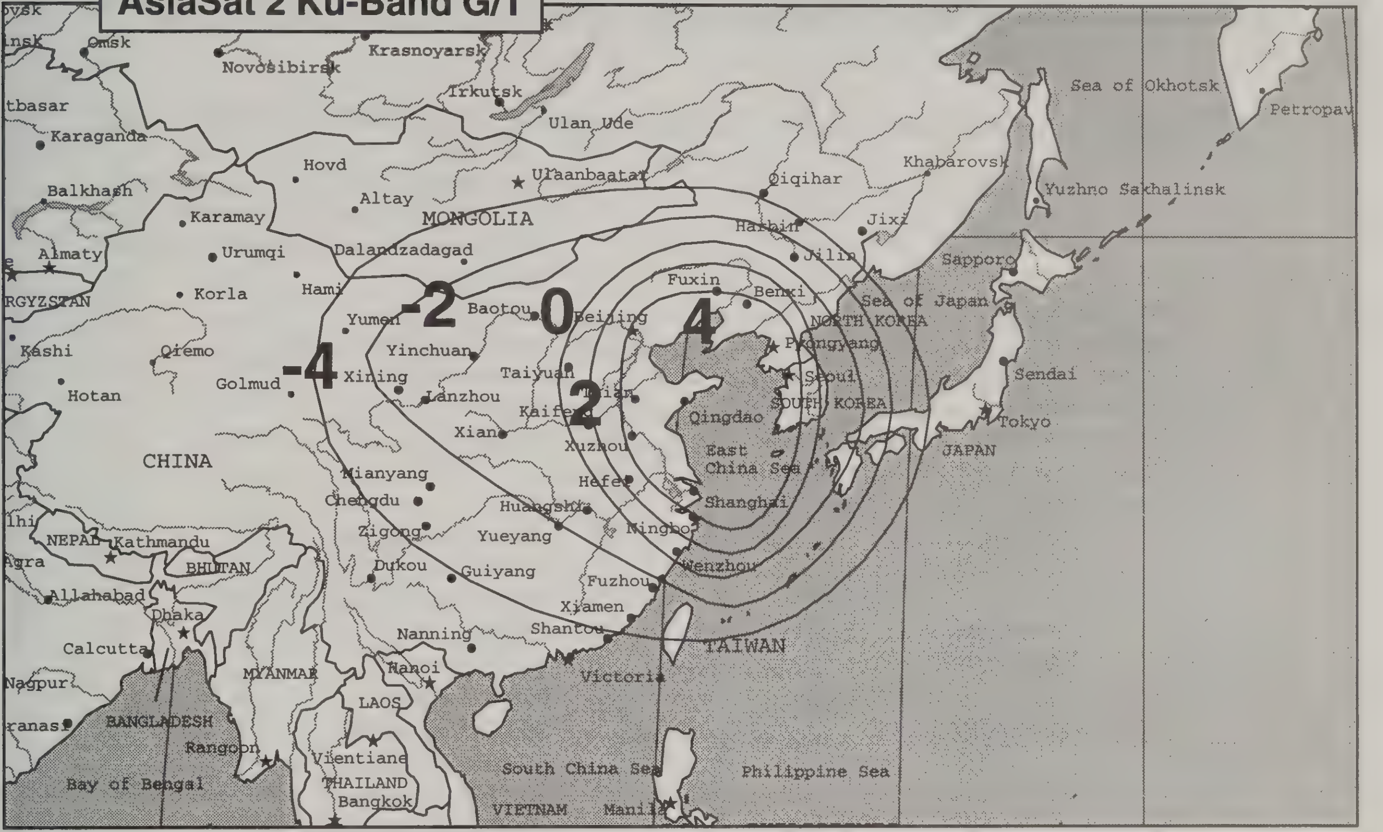


AsiaSat 2 C-Band G/T



AsiaSat 2 Ku-Band EIRP (dBW)

AsiaSat 2 Ku-Band G/T



ASIASAT 3 SYSTEM At A Glance

Satellite name:	AsiaSat 3, 105.5°E (to be launched)
Spacecraft data:	
Area of coverage:	Asia, Middle East, CIS, Australasia (C-band); 3 beams: China beam, South Asia beam and one steerable beam (Ku-band)
Mass (at launch):	3,410 kg
Stabilization:	3-axis body-stabilized
Launch date:	October 1997
Launch vehicle:	Proton D-1-e
Expected lifetime:	15 years
Transponders:	
Number:	28 C-band, 16 Ku-band
Power output:	55 W TWTA (C-band); 138 W TWTA (Ku-band)
Polarization:	Linear
Redundancy:	4:2 (C-band); 6:4 (Ku-band)
Bandwidth:	36 MHz (C-band); 54 MHz (Ku-band)
EIRP:	40 dBW (C-band), 53 dBW (Ku-band)
Satellite receiving G/T:	-1 dB/K maximum (C-band); 7 dB/K maximum (Ku-band)
Frequency band:	6/4 GHz (C-band); 14/12 GHz (Ku-band)
Single carrier saturation flux density:	-98 dBW/m^2 maximum @ G/T = -1 dB/K with 0 dB attenuation (C-band); -100 dBW/m2 maximum @ G/T = 7 dB/K with 0 dB attenuation
Manufacturer:	Hughes Space and Communications

AsiaSat 3 C-Band Transponder Frequency Plan

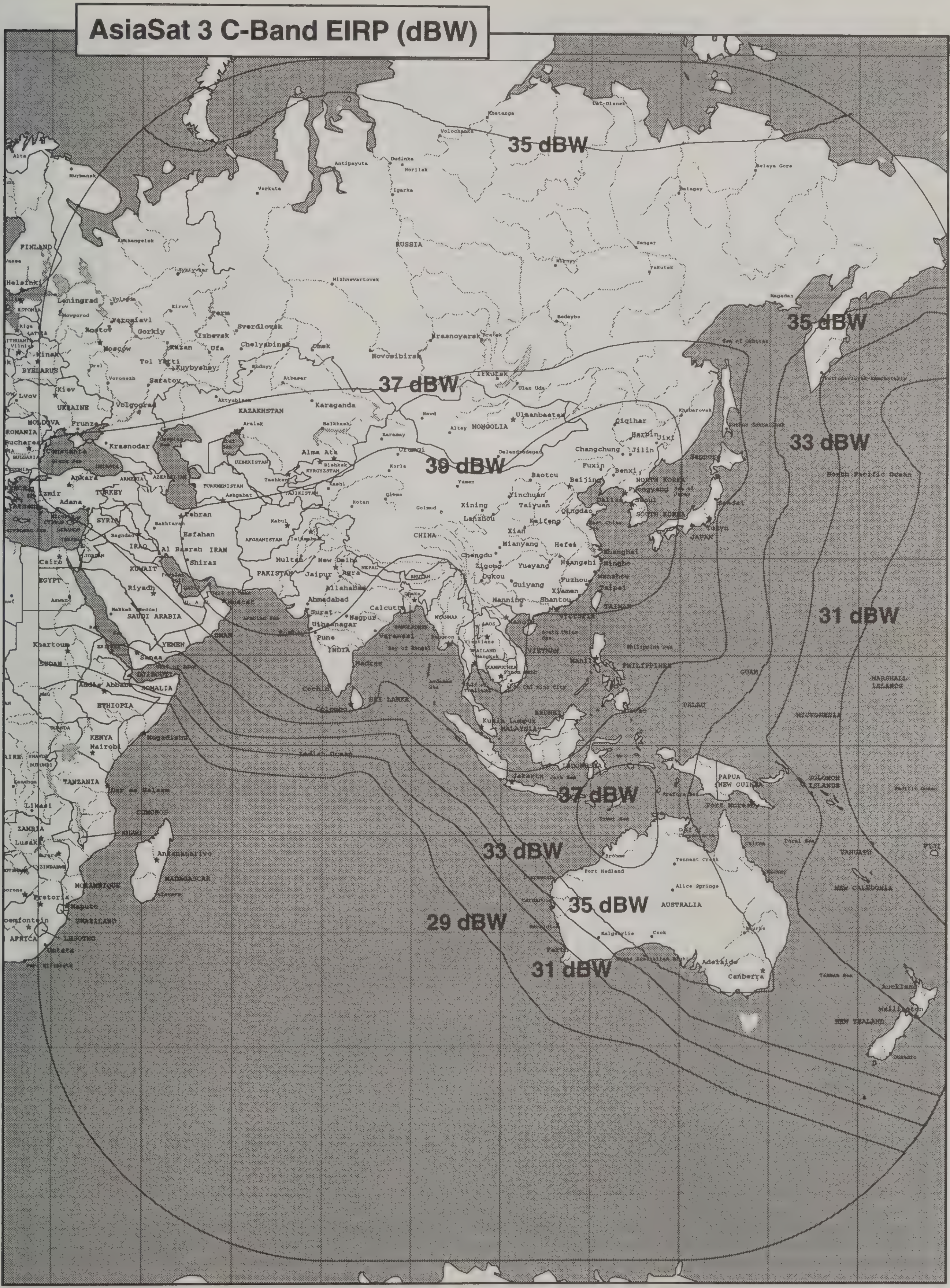
Tr.#	Pol.*	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1A	Linear	36	40	5.885	3.660
1B	Linear	36	40	5.865	3.640
2A	Linear	36	40	5.925	3.700
2B	Linear	36	40	5.905	3.680
3A	Linear	36	40	5.965	3.740
3B	Linear	36	40	5.945	3.720
4A	Linear	36	40	6.005	3.780
4B	Linear	36	40	5.985	3.760
5A	Linear	36	40	6.045	3.820
5B	Linear	36	40	6.025	3.800
6A	Linear	36	40	6.085	3.860
6B	Linear	36	40	6.065	3.840
7A	Linear	36	40	6.125	3.900
7B	Linear	36	40	6.105	3.880
8A	Linear	36	40	6.165	3.940
8B	Linear	36	40	6.145	3.920
9A	Linear	36	40	6.205	3.980
9B	Linear	36	40	6.185	3.960
10A	Linear	36	40	6.245	4.020
10B	Linear	36	40	6.225	4.000
11A	Linear	36	40	6.285	4.060
11B	Linear	36	40	6.265	4.040
12A	Linear	36	40	6.325	4.100
12B	Linear	36	40	6.305	4.080
13A	Linear	36	40	6.365	4.140
13B	Linear	36	40	6.345	4.120
14A	Linear	36	40	6.405	4.180
14B	Linear	36	40	6.385	4.160

*The polarization is vertical for downlink "A" and uplink "B."
The polarization is horizontal for uplink "A" and downlink "B."

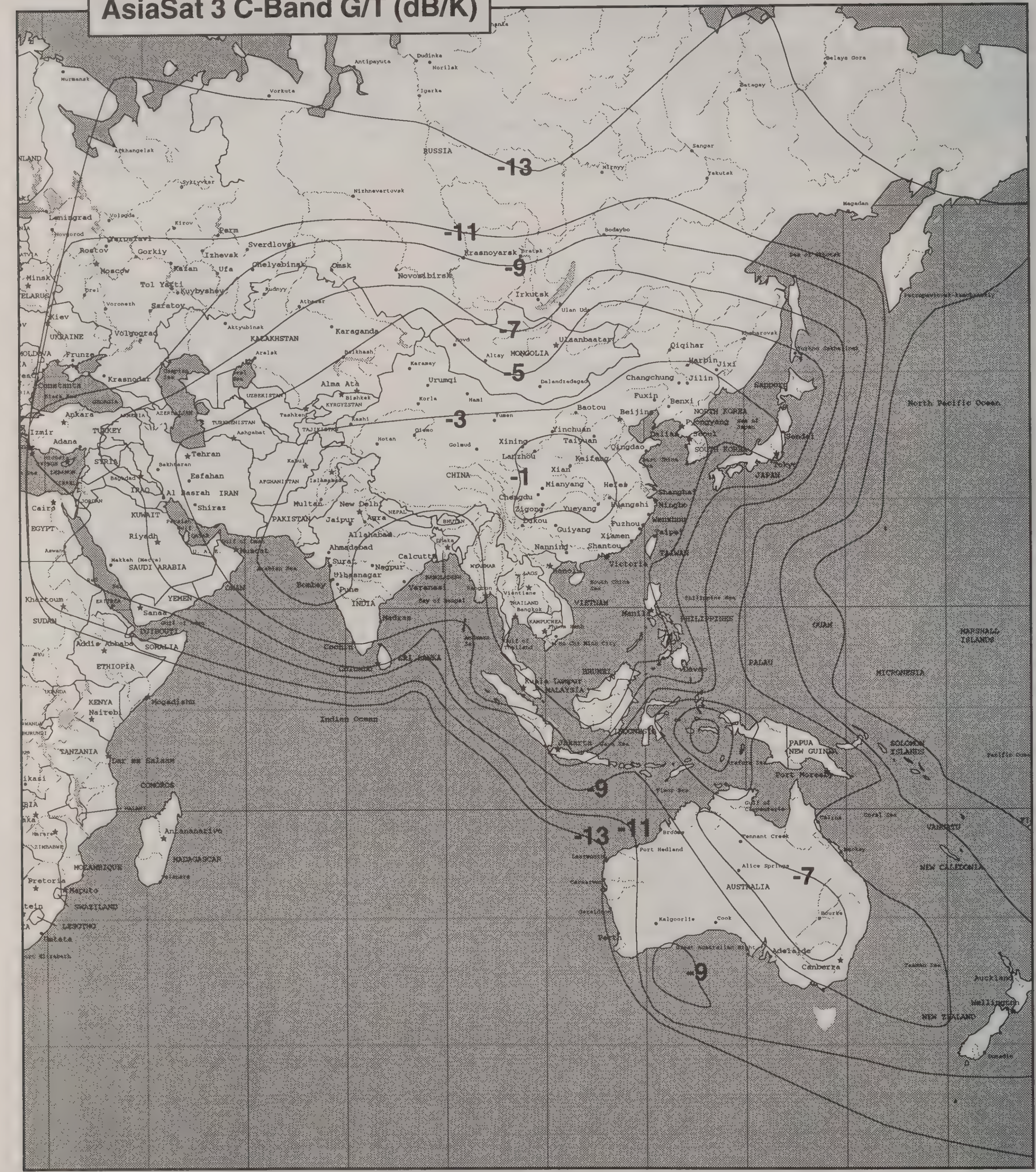
AsiaSat 3 Ku-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
China Beam					
1A	Linear	54	53	14.028	12.280
1B	Linear	54	53	14.048	12.300
2A	Linear	54	53	14.088	12.340
2B	Linear	54	53	14.108	12.360
3A	Linear	54	53	14.148	12.400
3B	Linear	54	53	14.168	12.420
4A	Linear	54	53	14.208	12.460
4B	Linear	54	53	14.228	12.480
5A	Linear	54	53	14.260	12.520
5B	Linear	54	53	14.288	12.540
6A	Linear	54	53	14.328	12.580
6B	Linear	54	53	14.348	12.600
7A	Linear	54	53	14.388	12.640
7B	Linear	54	53	14.408	12.660
8A	Linear	54	53	14.448	12.700
8B	Linear	54	53	14.468	12.720
South Asia Beam					
1B	Linear	54	53	14.048	12.300
2B	Linear	54	53	14.108	12.360
3B	Linear	54	53	14.168	12.420
4B	Linear	54	53	14.228	12.480
5B	Linear	54	53	14.288	12.540
6B	Linear	54	53	14.348	12.600
7B	Linear	54	53	14.408	12.660
8B	Linear	54	53	14.468	12.720
Steerable Beam					
5B	Linear	54	53	14.288	12.540
6B	Linear	54	53	14.348	12.600
7B	Linear	54	53	14.408	12.660
8B	Linear	54	53	14.468	12.720

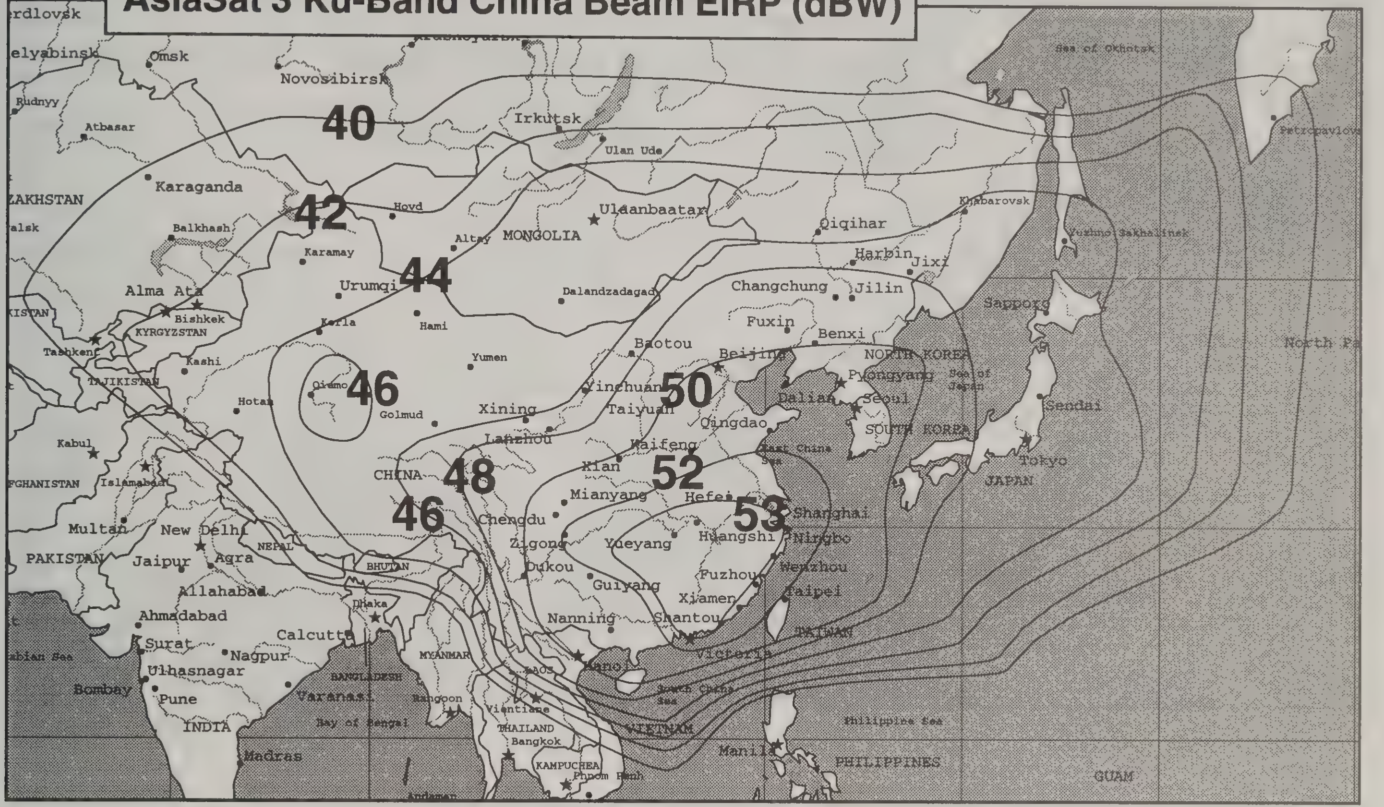
AsiaSat 3 C-Band EIRP (dBW)



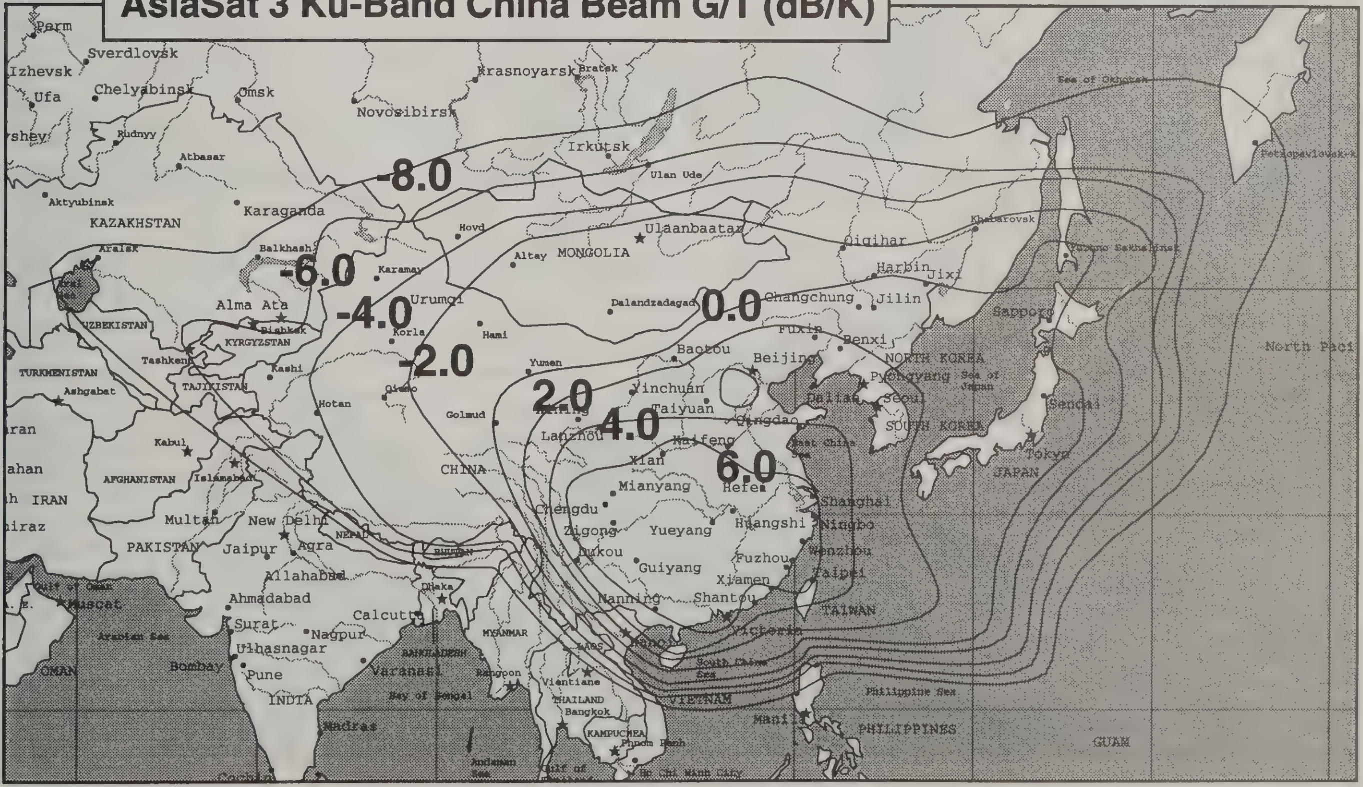
AsiaSat 3 C-Band G/T (dB/K)



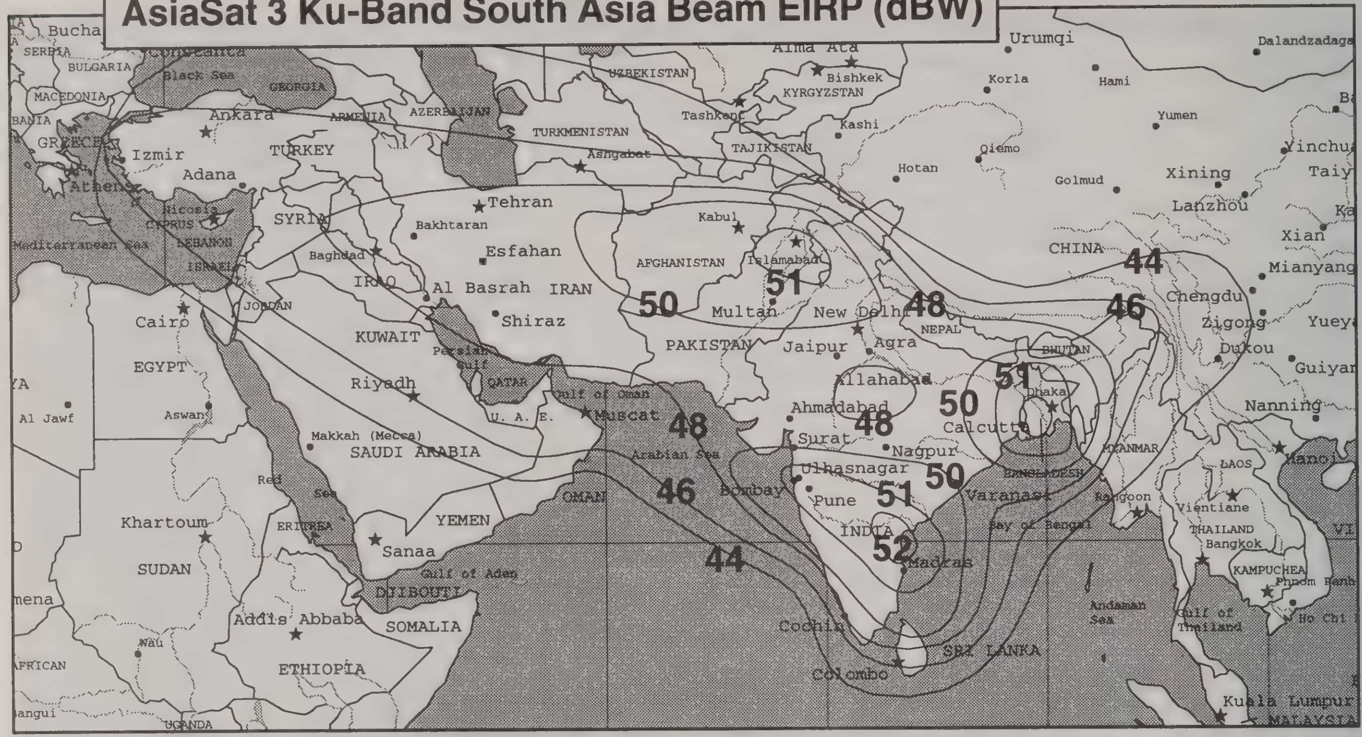
AsiaSat 3 Ku-Band China Beam EIRP (dBW)



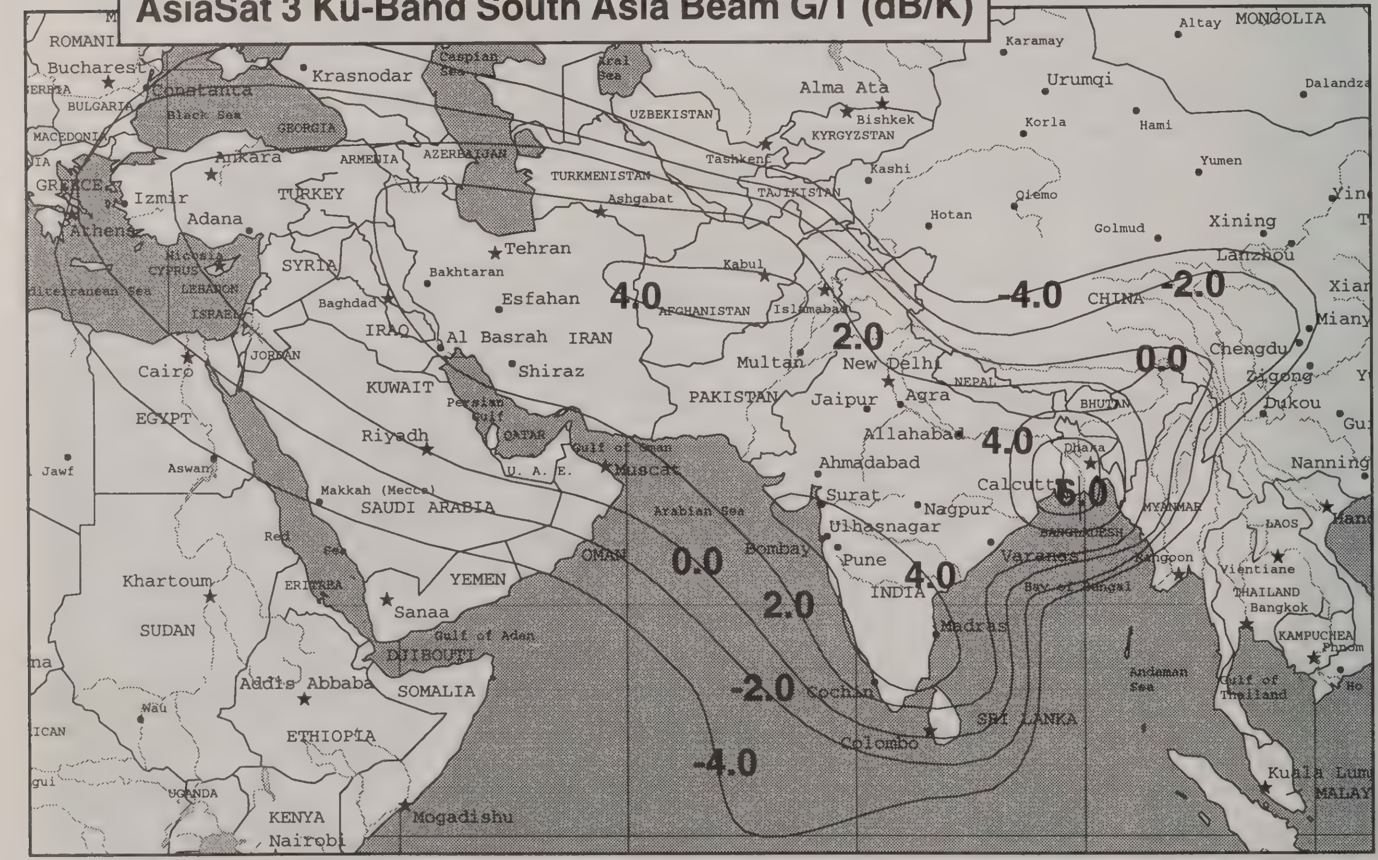
AsiaSat 3 Ku-Band China Beam G/T (dB/K)



AsiaSat 3 Ku-Band South Asia Beam EIRP (dBW)



AsiaSat 3 Ku-Band South Asia Beam G/T (dB/K)



EUTELSAT
(EUROPEAN TELECOMMUNICATIONS SATELLITE ORGANIZATION)

Tour Maine-Montparnasse
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F-75755 Paris Cedex 15
FRANCE

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Telex: 203823
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Givliano Berretta, Commercial Director
Dg Hardman, Finance Director
Andreas Langemeyer, Technical Director
Jesus Domingo Laborda, Operations Director

Public Relations Contact:

Vanessa O'Connor, Press and Public Relations Manager, +33 1-45-38-47-57

Overview:

Created in 1977 and formally established in 1985, Eutelsat operates Europe's regional satellite system. The organization's members are telecommunications operators in 44 European countries. Eutelsat satellites carry international and domestic public fixed and mobile telecommunications. The organization can also offer specialized telecommunications services.

Services Offered:

- Telephony
- Television
- Radio
- Data
- Land mobile traffic
- Satellite newsgathering

Satellite Control:

TT&C stations: Redu, Belgium; Paris, France

Eutelsat Member Countries

Country	Signatory	Investment Share %
Albania	Albanian Telecommunications Enterprise	0.29621
Andorra	Servei de Télécommunications d'Andorra	0.05000
Armenia	Ministry of Telecommunications	0.05000
Austria	Adminstration Autrichienne des Postes et Télégraphes	0.62322
Azerbaijan	Azerbaijan Ministry of Communications	0.05000
Belarus	Ministry of Posts, Telecommunications and Informatics	0.05000
Belgium	RTT Belgacom	5.67663
Bosnia-Hercegovina	Public Enterprise of PTT Transport	0.05000
Croatia	Ministry of Maritime Affairs, Transport and Communications	0.05000
Cyprus	Cyprus Telecommunications Authority	2.25588
Czech Republic	Ceske Radiokomunikace AS	0.05004
Denmark	Tele Danmark AS	2.71001
Finland	Fintelcom	0.26729
France	France Telecom	14.23747
Georgia	Georgian Ministry of Communications	0.05000
Germany	Deutsche Bundespost Telekom	11.22615
Greece	OTE	0.18446
Hungary	Hunsat	1.06577
Iceland	Post and Telecommunications Administration of Iceland	0.05000
Ireland	Telecom Eireann	0.24096
Italy	Telecom Italia	8.39211
Latvia	Lattelekom	0.15387
Liechtenstein	Government of the Principality of Liechtenstein	0.05000
Lithuania	Lithuanian Ministry of Communications and Informatics	0.05000
Luxembourg	Administration Luxembourgeois des Postes et Télécomunications	0.15378
Malta	Government of the Republic of Malta	0.05000
Moldova	Ministry of Informatics, Information and Communication	0.05000
Monaco	Government of the Principality of Monaco	0.05000
Netherlands	PTT Nederland NV	7.43303
Norway	Norwegian Telecom	0.43987
Poland	Polish Telecommunications SA	3.19234
Portugal	CPRM	2.49826
Romania	Romanian Ministry of Communications	0.19086
Russia	Ministry of Posts and Telecommunications	0.97267
San Marino	Government of the Republic of San Marino	0.05000
Slovakia	Slovak Telecom	0.05000
Spain	Telefonica	9.80387
Sweden	Telia AB	2.48468
Switzerland	Direction Générale de l'Enterprise des Postes, Télégraphes et Téléphones Suisses	1.57213
Turkey	Post and Telecommunications Administration of Turkey	2.05982
Ukraine	KRRT	0.05000
United Kingdom	BT	20.00000
Vatican	Government of the Holy See	0.05000
Yugoslavia	Community of Yugoslav Posts, Telegraphs and Telephones	0.51862

Bulgaria, Estonia, Kazakhstan, and Slovenia are completing membership procedures.

EUTELSAT I SYSTEM At A Glance

Satellite name: .... Eutelsat I-F1, 48ºE (inclined orbit);
Eutelsat I-F4, 25.5°E; Eutelsat I-F5, 21.5°E
Spacecraft data:
Mass (in orbit, BOL): .... 680 kg (Eutelsat I-F4, F5)
Stabilization: 3-axis
Primary power (EOL): .... 900 W
Launch date: .... June 1983 (F1)
September 16, 1987 (F4); July 1988 (F5)
Launch vehicle: .... Ariane
Expected lifetime: .... 7 years (exceeded)

Transponders:
Number: .... 10 (plus two back-up)
Power output: .... 20 W TWTA
Polarization: .... Dual linear

Single carrier saturation flux density: .... -79.3 to -94 dBW/sq.m.

Manufacturer: .... British Aerospace

Eutelsat I Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	H	72	42*	14.291	10.991
2	H	72	42*	14.375	11.075
3	H	72	42*	14.458	11.158
4	H	72	42*	14.041	11.491
5	H	72	42*	14.125	11.575
6	H	72	42*	14.208	11.658
7	V	72	42*	14.291	10.991
8	V	72	42*	14.375	11.075
9	V	72	42*	14.458	11.158
10	V	72	42*	14.041	11.491
11	V	72	42*	14.125	11.575
12	V	72	42*	14.208	11.658
13	H	72	42*	14.041	12.541
14	V	72	42*	14.041	12.541

* Spot beam at beam edge; Eurobeam: 36 dBW at beam edge

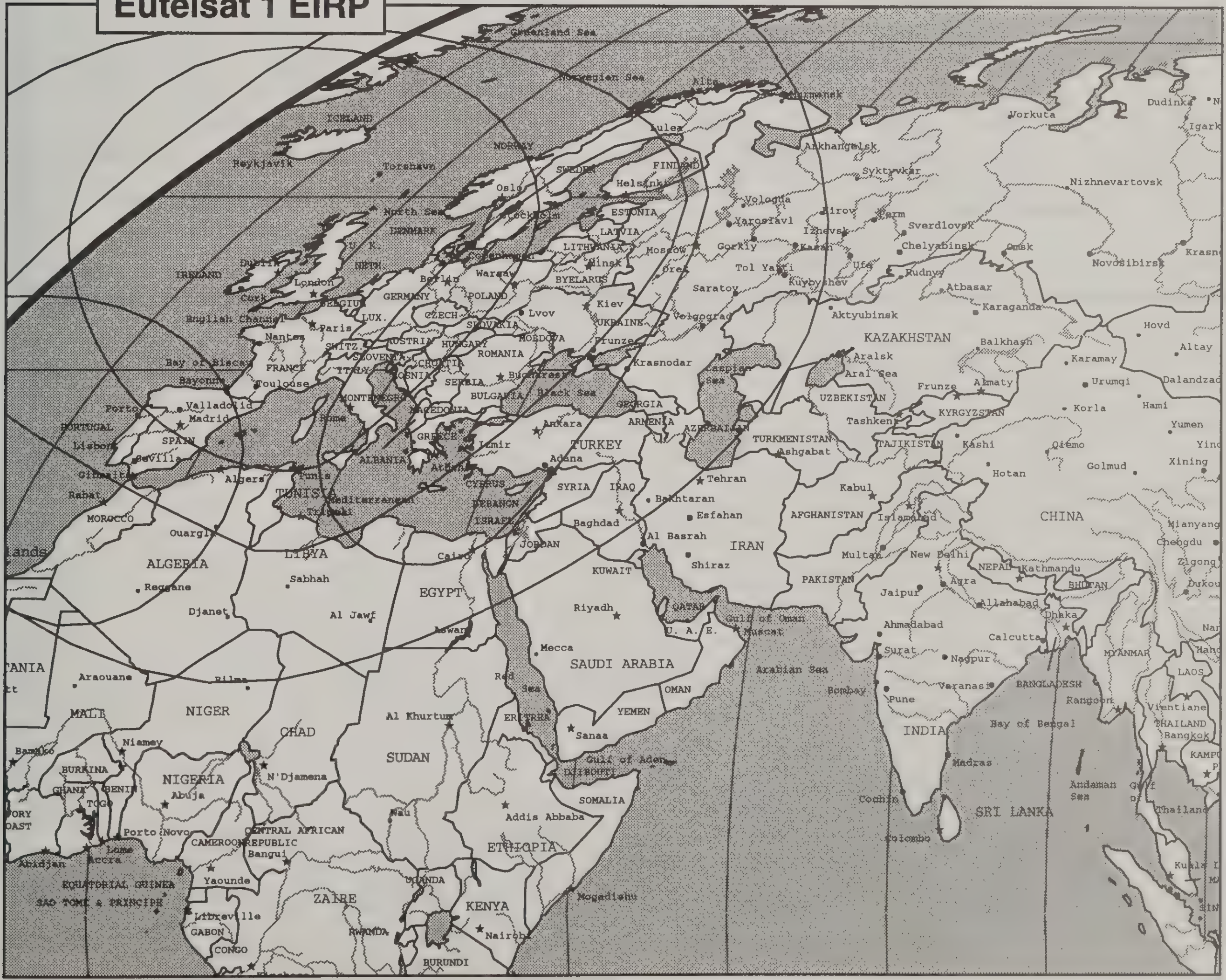
Eutelsat I

Orbital location:	48°E (F1), 25.5° (F4), 21.5°E (F5)
Launch:	June 1983, Ariane (F1), September 16, 1987, Ariane (F4), July 1988, Ariane (F5)
Expected lifetime:	7 years
Expected end of life:	F1, F4 and F5 have exceeded their 7 year design life

Antennas beam coverage overview:

Ku-beam:	Europe

Eutelsat 1 EIRP



EUTELSAT II SYSTEM At A Glance

Satellite name: Eutelsat II-F1, 13°E; Eutelsat II-F2, 10°E; Eutelsat II-F3, 16°E; Eutelsat II-F4, 7°E

Spacecraft data:
- Mass (at launch): F1 to F4: 1,875 kg
- Stabilization: 3-axis
- Primary power (EOL): 3,000 W
- Launch date: August 30, 1990 (F1); January 15, 1991 (F2); December 7, 1991 (F3); July 9, 1992 (F4)
- Launch vehicle: Ariane (F1, F2, F4); Atlas (F3)
- Expected lifetime: 9 years

Transponders:
- Number: 16 simultaneously active (plus 8 back-up)
- Power output: F1 to F4: 50 W TWTA; F6: 70 W TWTA
- Polarization: Dual linear
- Bandwidth: F1 to F4: 72 MHz (7 transponders); 36 MHz (9 transponders); F6: 36 MHz
- Redundancy: 12:8 ring
- Uplink frequency: F1 to F4: 14.0-14.5 GHz; F6: 12.89-13.25 GHz
- Downlink frequency: F1 to F4: 10.95-11.20 GHz, 11.45-11.70 GHz, 12.50-12.75 GHz; F6: 11.20 - 11.55 GHz
- EIRP: F1 to F4: 44-52 dBW (Superbeam), 42-47 dBW (Widebeam); F6: 43 - 49 dBW

Manufacturer: Aerospatiale

Eutelsat II-F1 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)*	Downlink(GHz)
20	H	72/36	52/47	10.99167
21	H	72/36	52/47	11.07500
22	H	72/36	52/47	11.15833
25	V	72/36	52/47	10.99167
26	V	72/36	52/47	11.07500
27	V	72/36	52/47	11.15833
32	H	72/36	52/47	11.55441
33	H	72/36	52/47	11.59591
34	H	72/36	52/47	11.65833
37	V	72/36	52/47	11.57516
38	V	72/36	52/47	11.61666
39	V	72/36	52/47	11.65816
40	H	72/36	52/47	12.52141
41	H	72/36	52/47	12.56291
45	V	72/36	52/47	12.54216
46	V	72/36	52/47	12.58366

*Superbeam 52 dBW, Widebeam 47 dBW

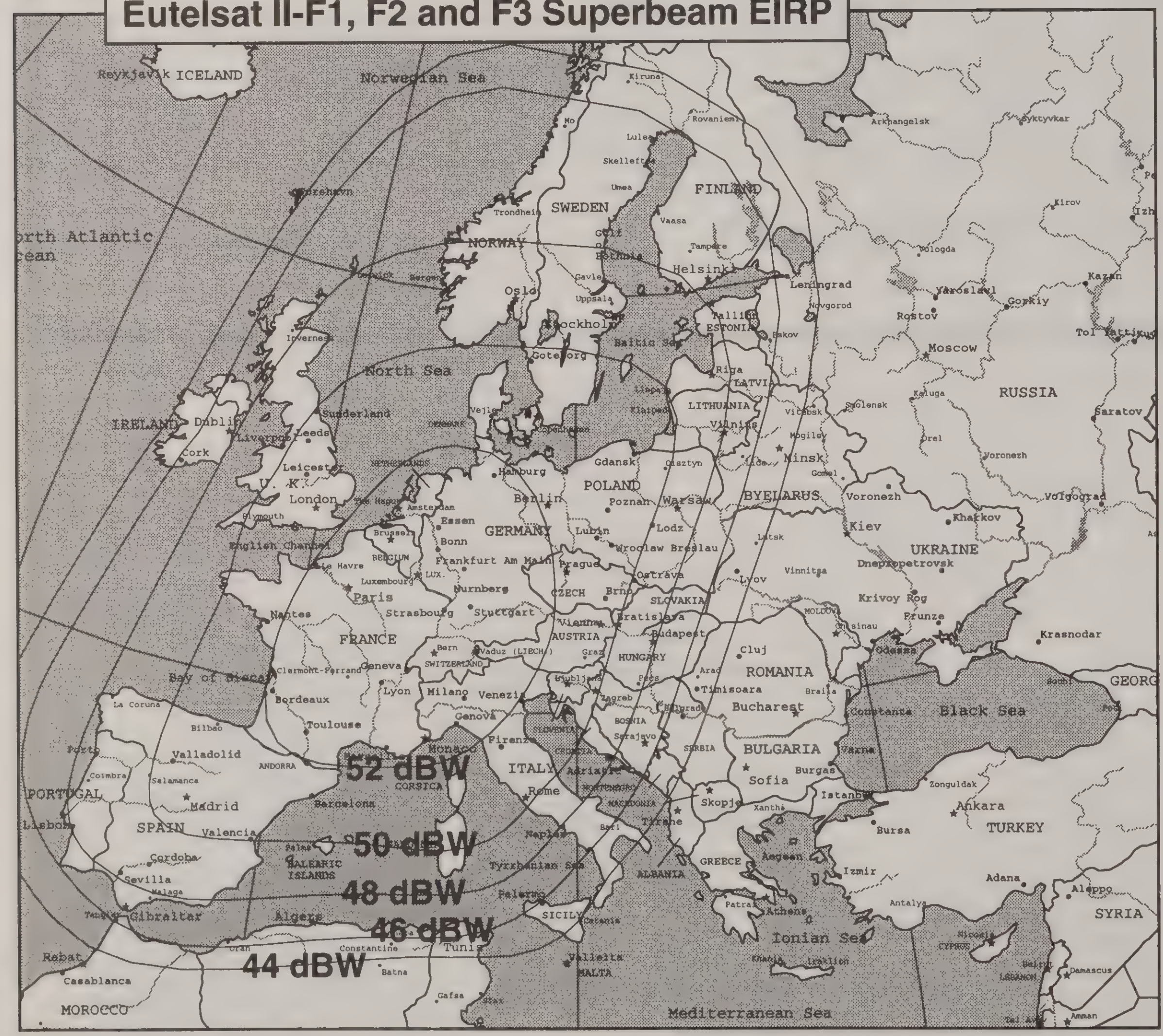
Eutelsat II-F1, F2 and F3

Orbital location: 13ºE (F1); 10ºE (F2); 16ºE (F3)
Launch: August 30, 1990, Ariane (F1);
January 15, 1991, Ariane (F2);
December 7, 1991, Atlas (F3)
Expected lifetime: 9 years
Expected end of life: 1998, 1999

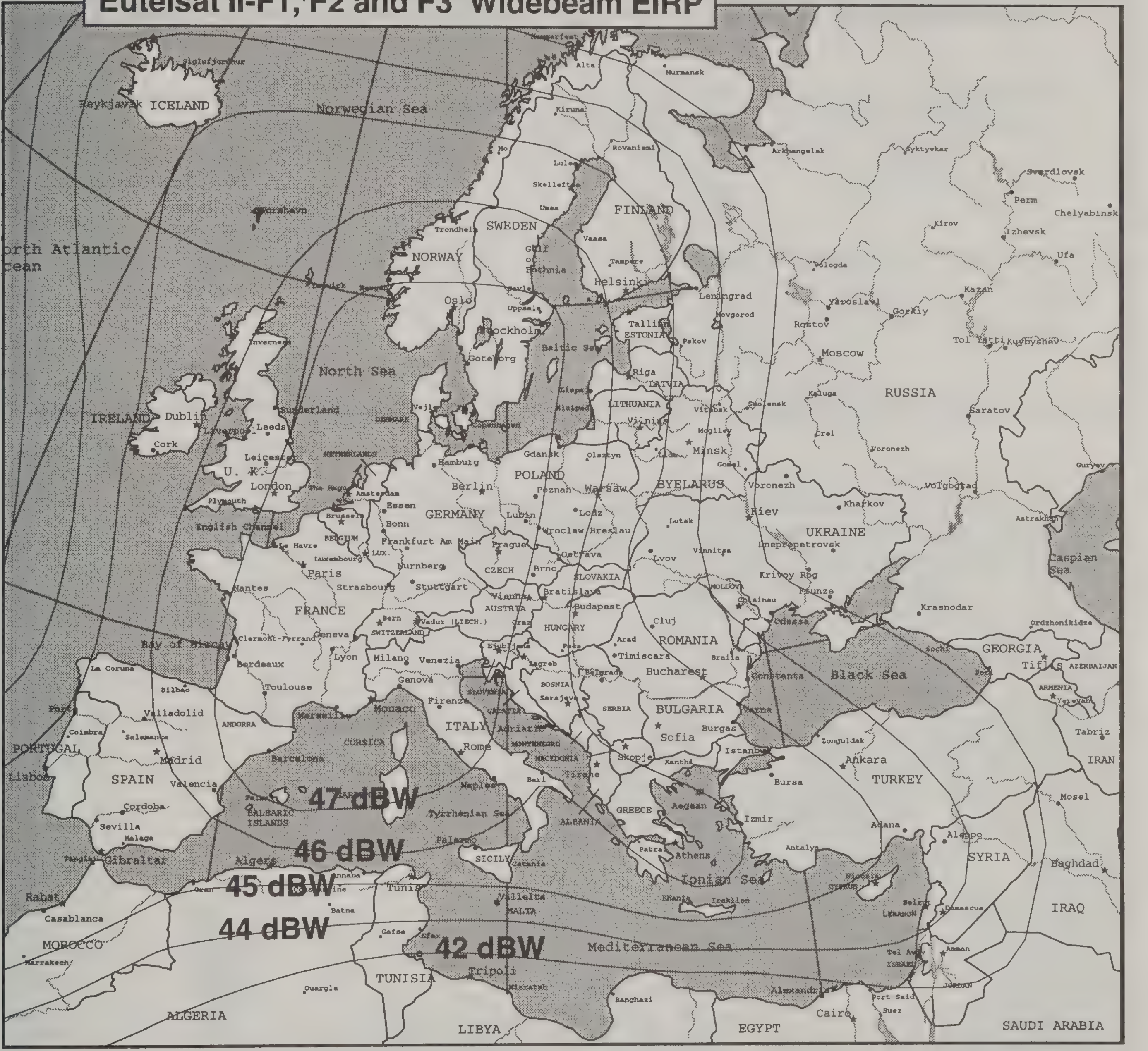
Antennas beam coverage overview:

Ku-band: Europe

Eutelsat II-F1, F2 and F3 Superbeam EIRP



Eutelsat II-F1, F2 and F3 Widebeam EIRP



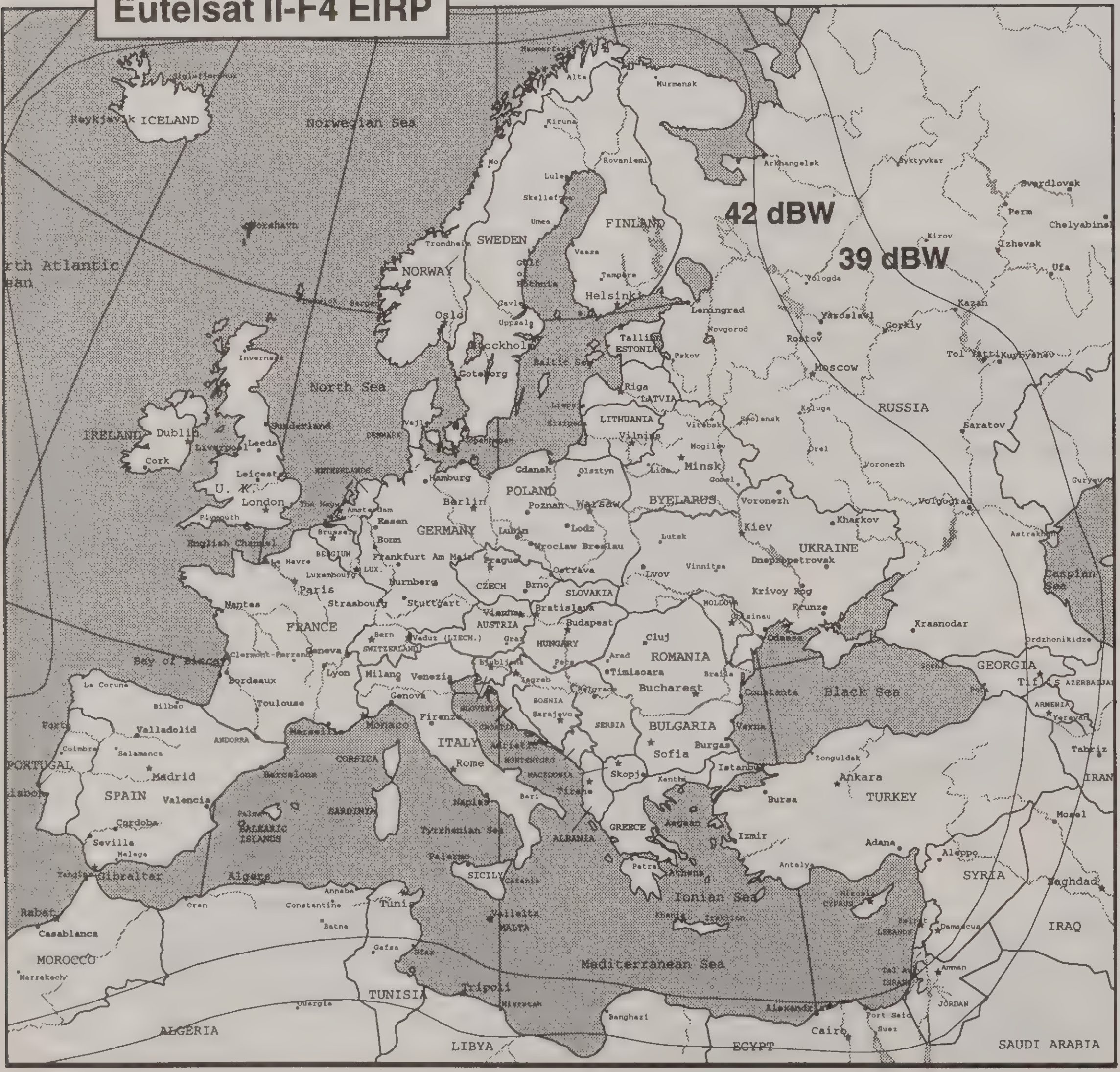
Eutelsat II-F4

Orbital location:	7°E
Launch:	July 9, 1992, Ariane
Expected lifetime:	9 years
Expected end of life:	2001

Antennas beam coverage overview:

Ku-band:	Europe

Eutelsat II-F4 EIRP



HOT BIRD SYSTEM At A Glance

Satellite name: Hot Bird 1, 13°E; Hot Bird 2, 13°E;
Hot Bird 3, 13°E*; Hot Bird 4, 13°E*;
Hot Bird 5, 13°E*

Spacecraft data:

- Mass (at launch): 1,800 kg
- Stabilization: 3-axis
- Primary power (EOL): 3,000 W
- Launch date: March 28, 1995 (1); September 4, 1996 (2); July 1997 (3); October 1997 (4); May 1998 (5)
- Launch vehicle: Atlas (1); Ariane (5)
- Expected lifetime: 11 years (1); 14.5 years (2, 3, 4)

- Transponders:
  - Number: 16 simultaneously active (plus 8 backup) (1); 20 (2, 3, 4); 22 (5)
  - Power output: 70 W TWTA (1); 120 W (2 and 3); 130 W (4)
  - Polarization: Dual linear
  - Bandwidth: 36 MHz (1); 33 MHz (2); 19 transponders @ 33 MHz, 1 @ 50 MHz (3); 17 @ MHz, 2 @ 36 MHz, 1 @ 47 MHz (4)
  - Uplink frequency: 12.89-13.25 GHz
  - Downlink frequency: 11.20-11.55 GHz (1); 11.70-12.10 GHz (2); 12.10-12.50 GHz (3); 10.70-10.95 and 12.50-12.75 GHz (4)
  - EIRP: Super-Widebeam 52 dBW (1); Superbeam 53 dBW, Widebeam 49 dBW (2, 3, 4)

- Manufacturer: Aerospatiale (1, 2); Matra Marconi (3, 4, 5)

*To be launched

Hot Bird 1 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Downlink(GHz)
1	H	36	49	11.22075
2	V	36	49	11.24150
3	H	36	49	11.26225
4	V	36	49	11.28300
5	H	36	49	11.30375
6	V	36	49	11.32450
7	H	36	49	11.34525
8	V	36	49	11.36600
9	H	36	49	11.38675
10	V	36	49	11.40750
11	H	36	49	11.42825
12	V	36	49	11.44900
13	H	36	49	11.47141
14	V	36	49	11.49216
15	H	36	49	11.51291
16	V	36	49	11.53366

Hot Bird 2 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)*	Downlink(GHz)
50	V	33	53/49	11.72748
51	H	33	53/49	11.74666
52	V	33	54/49	11.76584
53	H	33	53/49	11.78502
54	V	33	53/49	11.80420
55	H	33	53/49	11.82338
56	V	33	53/49	11.84256
57	H	33	53/49	11.86174
58	V	33	53/49	11.88092
59	H	33	53/49	11.90010
60	V	33	53/49	11.91928
61	H	33	53/49	11.93846
62	V	33	53/49	11.95764
63	H	33	53/49	11.97682
64	V	33	53/49	11.99600
65	H	33	53/49	12.01518
66	V	33	53/49	12.03436
67	H	33	53/49	12.05354
68	V	33	53/49	12.07272
69	H	33	53/49	12.09190

*Superbeam 53 dBW, Widebeam 49 dBW

Hot Bird 3 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)*	Downlink(GHz)
70	V	33/50	53/49	12.11108
71	H	33/50	53/49	12.13026
72	V	33/50	54/49	12.14944
73	H	33/50	53/49	12.16862
74	V	33/50	53/49	12.18780
75	H	33/50	53/49	12.20698
76	V	33/50	53/49	12.22616
77	H	33/50	53/49	12.24534
78	V	33/50	53/49	12.26452
79	H	33/50	53/49	12.28370
80	V	33/50	53/49	12.30288
81	H	33/50	53/49	12.32206
82	V	33/50	53/49	12.34124
83	H	33/50	53/49	12.36042
84	V	33/50	53/49	12.37960
85	H	33/50	53/49	12.39878
86	V	33/50	53/49	12.41796
87	H	33/50	53/49	12.43714
88	V	33/50	53/49	12.46591
89	H	33/50	53/49	12.47550

*Superbeam 53 dBW, Widebeam 49 dBW

Hot Bird 4 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)*	Downlink(GHz)
95	H	33/36/47	53/49	12.61574
96	V	33/36/47	54/49	12.63492
97	H	33/36/47	53/49	12.65410
98	V	33/36/47	53/49	12.67328
99	H	33/36/47	53/49	12.69246
100	V	33/36/47	53/49	12.71328
101	H	33/36/47	53/49	12.73082
110	V	33/36/47	53/49	10.71918
111	H	33/36/47	53/49	10.72713
112	V	33/36/47	53/49	10.75754
113	H	33/36/47	53/49	10.77508
114	V	33/36/47	53/49	10.79590
115	H	33/36/47	53/49	10.81508
116	V	33/36/47	53/49	10.83426
117	H	33/36/47	53/49	10.85344
118	V	33/36/47	53/49	10.87262
119	H	33/36/47	53/49	10.89180
120	V	33/36/47	53/49	10.91098
121	H	33/36/47	53/49	10.93016
122	V	33/36/47	53/49	10.94934

*Superbeam 53 dBW, Widebeam 49 dBW

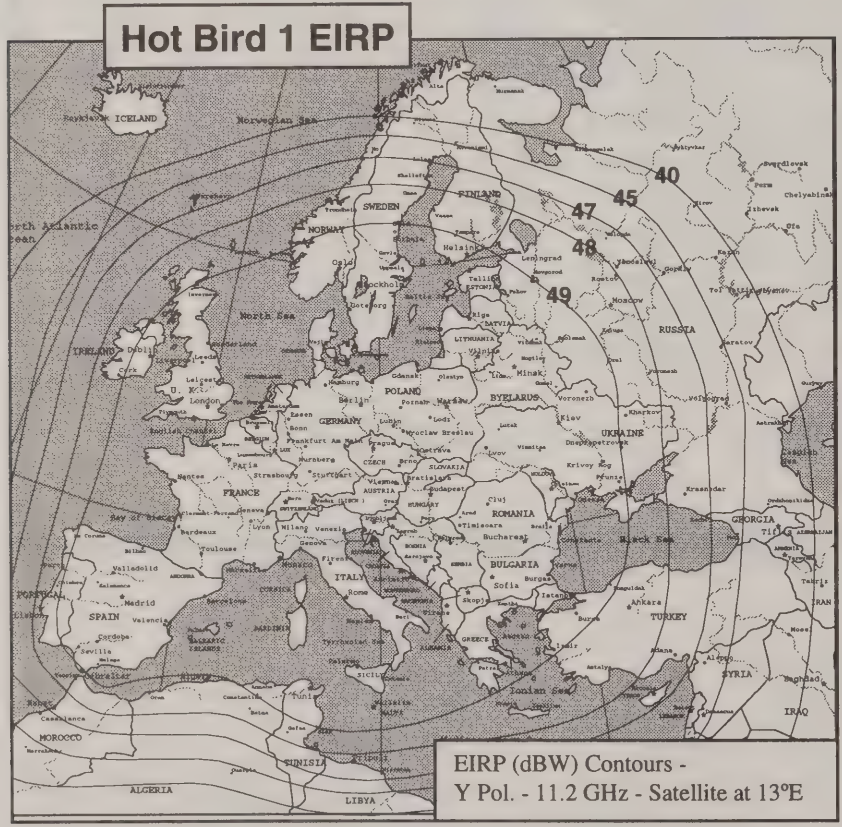
Hot Bird 1, 2, 3, 4, and 5

Orbital location:	13°E (1, 2, 3, 4, and 5)
Launch:	March 28, 1995, Atlas (1); September 4, 1996 (2); July 1997 (3); October 1997 (4); May 1998, Ariane (5)
Expected lifetime:	11 years (1); 14.5 years (2, 3, 4)
Expected end of life:	2006 (1); 2011 (2, 3, 4); 2012 (5)

Antennas beam coverage overview:

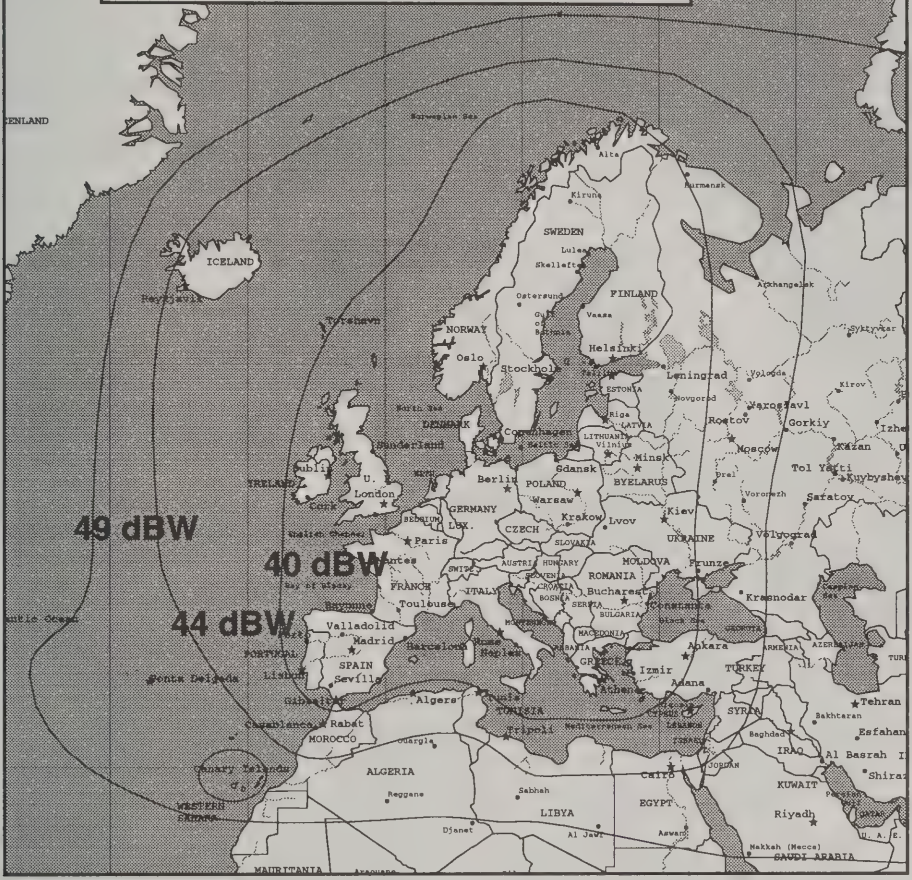
Ku-band:	Europe

Hot Bird 1 EIRP

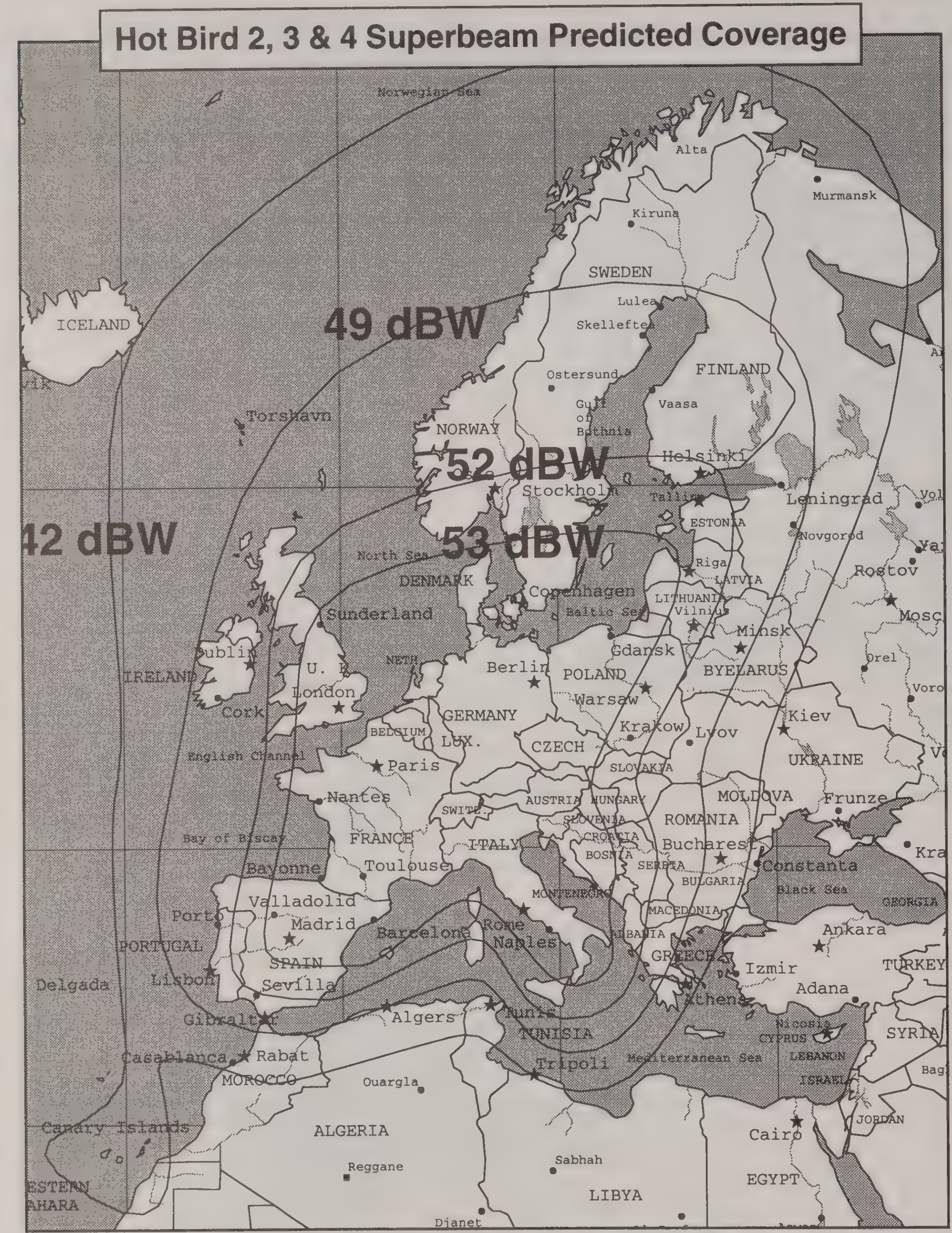


EIRP (dBW) Contours -
Y Pol. - 11.2 GHz - Satellite at 13°E

Hot Bird 2 Widebeam Coverage



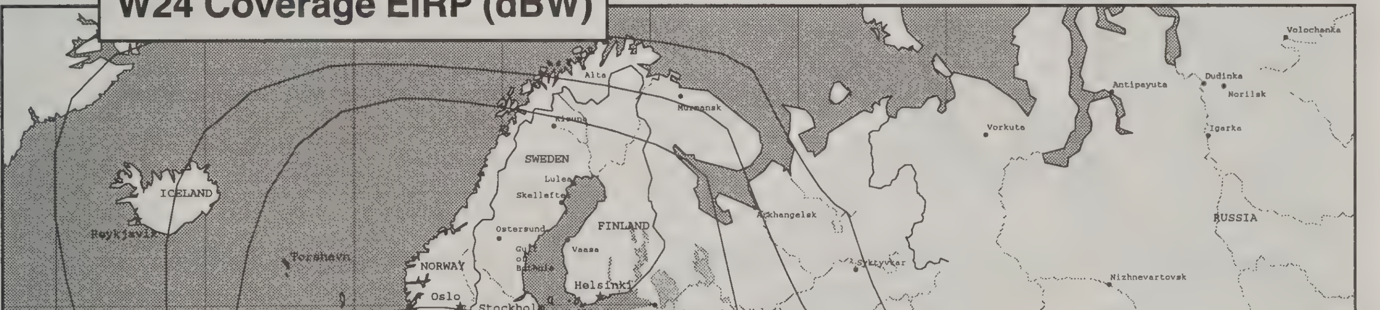
Hot Bird 2, 3 & 4 Superbeam Predicted Coverage



W24 SYSTEM At A Glance

Satellite name:	W24 1, 7°E; W24 2, 10°E; W24 3, 16°E (all to be launched)
Spacecraft data:	
Launch date:	1998 (1); 1998 (2); 1998 (3)
Expected lifetime:	12 years
Transponders:	
Number:	24 @ 90 W
Bandwidth:	72 MHz
Manufacturer:	Aerospatiale

W24 Coverage EIRP (dBW)



SESAT SYSTEM At A Glance

Satellite name: .... Sesat, 48°E (to be launched)

Spacecraft data:

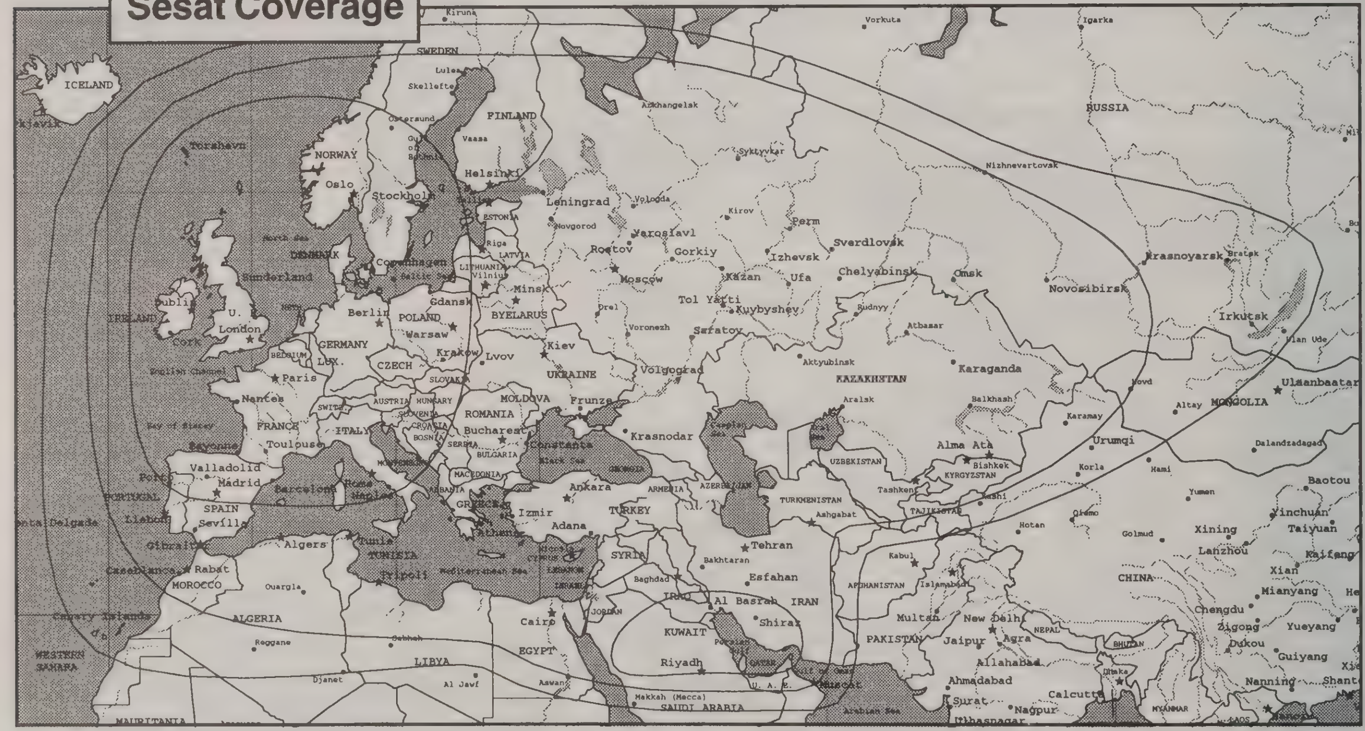
Launch date: .... Early 1998

Transponders:

Number: 18

Manufacturer: .... NPO-PM

Sesat Coverage



Note: EIRP values not available as of press time

SOCIETE EUROPEENNE DES SATELLITES (SES)

L-6815 Chateau de Betzdorf
LUXEMBOURG

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Facsimile:	+352 710-725-227
Web Site Address:	www.astra.lu

Booking Contact:

Pascale Reuland, Marketing Communications and Public Relations Assistant

Press Relations Contact:

Yves Feltes, Press Relations Manager

Public Relations Contacts:

Thomas Herr, Marketing Communications and Public Relations Manager

Overview:

SES is the private operating company of the Astra direct broadcast satellite system, providing television and radio broadcasts to all of Europe.

Services Offered:

- Optimal quality broadcast of television and radio programs for direct-to-home reception across Europe
- All six satellites currently in operation are collocated at the same orbital position of 19.2°E, thus offering the largest possible choice of TV and radio services from one single orbital slot: up to 72 TV channels and even more radio subcarriers.

Satellite Control Network:

Satellite control:	Betzdorf
TT&C stations:	Betzdorf

ASTRA 1 SYSTEM At A Glance

Satellite name: .... Astra 1A; Astra 1B; Astra 1C;
Astra1D; Astra 1E; Astra 1F;
Astra 1G [to be launched];
Astra 1H [to be launched] (all 19.2°E)

Spacecraft data:

- Mass (launch): .... 1,768 kg (1A); 2,620 kg (1B); 2,790 kg (1C); 2,920 kg (1D); 3,000 kg (1E); 3,010 kg (1F)
- Primary power (EOL): .... 2,600 W (1A); 3,440 W (1B); 3,300 W (1C, 1D); 4,150 W (1E); 4,400 W (1F)
- Eclipse protection: .... All transponders
- Stabilization: 3-axis
- Launch date: .... December 11, 1988 (1A); March 2, 1991 (1B); May 11, 1993 (1C); October 31, 1994 (1D); October 18, 1995 (1E); April 9, 1996 (1F); June 1997 (1G); 1998 (1H)
- Launch vehicle: .... Ariane 44 LP-Flight 27 (1A); Ariane 44 LP-Flight 42 (1B); Ariane 42L-Flight 56 (1C); Ariane 42P-Flight 69 (1D); Ariane 42L-Flight 79 (1E); Proton D-1-e (1F, 1G); TBD (1H)
- Expected lifetime: .... 12-15 years

- Transponders:
  - Number: .... 16 (1A,1B), 18 (1C, 1D, 1E), 22 for the first 5 years, 20 thereafter (1F)
  - Power output: .... 45 W TWTA (1A); 60 W TWTA (1B); 63 W TWTA (1C, 1D); 85 W TWTA (1E); 82 W TWTA (1F)
  - Polarization: .... Linear
  - Redundancy: 11:8

- Manufacturer: .... GE Astro Electronics (1A, 1B); Hughes (1C-1F)

Astra Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Downlink(GHz)
Astra 1A				
1	H	26	52	11.21425
2	V	26	52	11.22900
3*	H	26	52	11.24375
4	V	26	52	11.25850
5	H	26	52	11.27325
6	V	26	52	11.28800
7*	H	26	52	11.30275
8*	V	26	52	11.31750
9*	H	26	52	11.33225
10	V	26	52	11.34700
11*	H	26	52	11.36175
12	V	26	52	11.37650
13*	H	26	52	11.39125
14	V	26	52	11.40600
15	H	26	52	11.42075
16*	V	26	52	11.43550
Astra 1B				
17*	H	26	52	11.46425
18*	V	26	52	11.47900
19	H	26	52	11.49375
20*	V	26	52	11.50850
21	H	26	52	11.52325
22	V	26	52	11.53800
23*	H	26	52	11.55275
24*	V	26	52	11.56750
25	H	26	52	11.58225
26*	V	26	52	11.59700
27*	H	26	52	11.61175
28	V	26	52	11.62650
29	H	26	52	11.64125
30*	V	26	52	11.65600
31*	H	26	52	11.67075
32*	V	26	52	11.68550

* Encrypted or partially encrypted service

Astra Transponder Frequency Plan (Continued)

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Downlink(GHz)
Astra 1C				
33	H	26	52	10.96425
34*	V	26	52	10.97900
35*	H	26	52	10.99375
36*	V	26	52	11.00850
37	H	26	52	11.02325
38*	V	26	52	11.03800
39	H	26	52	11.05275
40*	V	26	52	11.06750
41*	H	26	52	11.08225
42*	V	26	52	11.09700
43	H	26	52	11.11175
44	V	26	52	11.12650
45	H	26	52	11.14125
46*	V	26	52	11.15600
47	H	26	52	11.17075
48	V	26	52	11.18550
Astra 1D				
49	H	26	52	10.71425
50	V	26	52	10.72900
51	H	26	52	10.74375
52	V	26	52	10.75850
53	H	26	52	10.77325
54	V	26	52	10.78800
55	H	26	52	10.80275
56	V	26	52	10.81750
57	H	26	52	10.83225
58	V	26	52	10.84700
59	H	26	52	10.86175
60	V	26	52	10.87650
61	H	26	52	10.89125
62	V	26	52	10.90600
63*	H	26	52	10.92075
64*	V	26	52	10.93550

* Encrypted or partially encrypted service

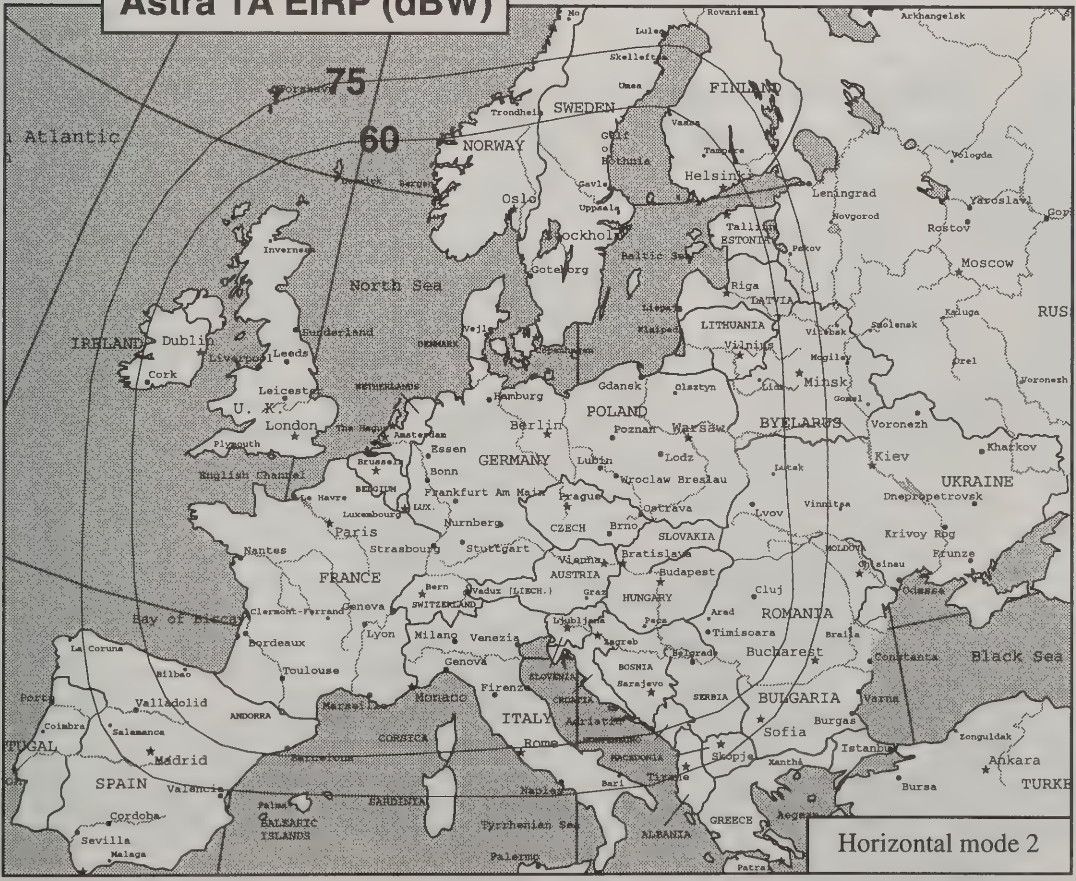
Astra 1A, 1B, 1C, 1D, 1E, and 1F

Orbital location:	19.2ºE (collocated)
Launch:	December 11, 1988, Ariane 44 LP-Flight 27 (1A); March 2, 1991, Ariane 44 LP-Flight 42 (1B); May 12, 1993, Ariane 42L-Flight 56 (1C); November 1, 1994, Ariane 42P-Flight 69 (1D); October 18, 1995, Ariane 42L (1E); April 9, 1996, Proton D-1-e (1F)
Expected lifetime:	12-15 years minimum
Expected end of life:	2001 (1A), 2003 (1B), 2007 (1C, 1D, 1E), 2008 (1F)

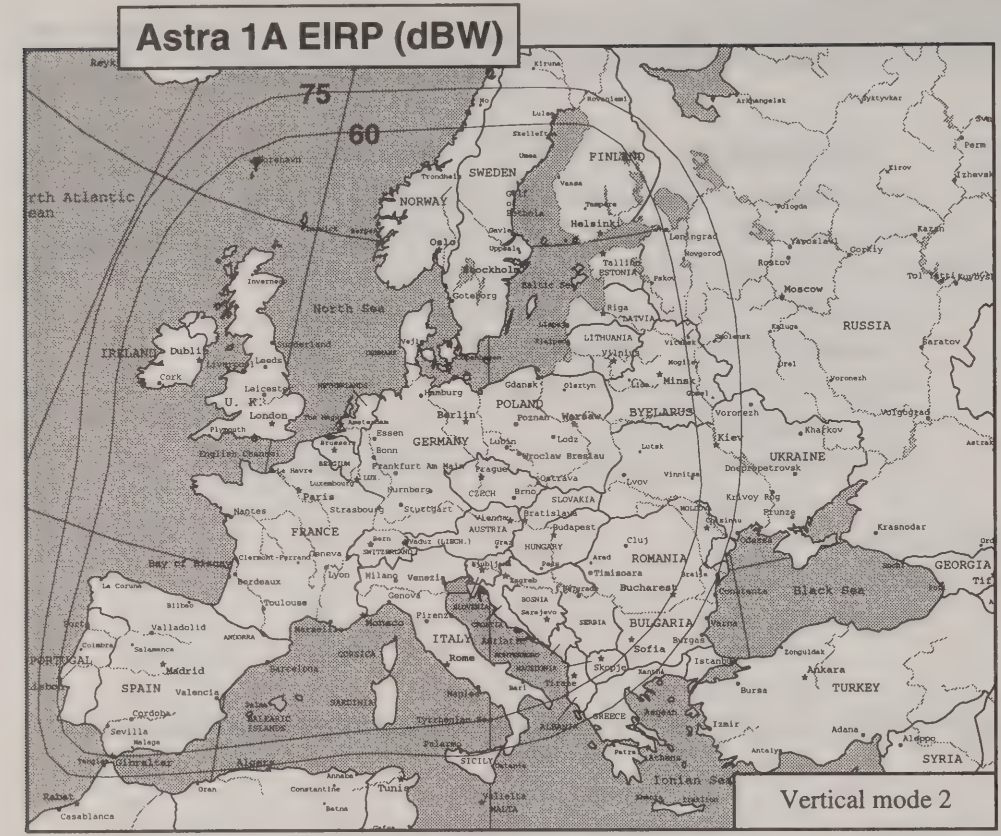
Antennas beam coverage overview

DBS:	Europe

Astra 1A EIRP (dBW)

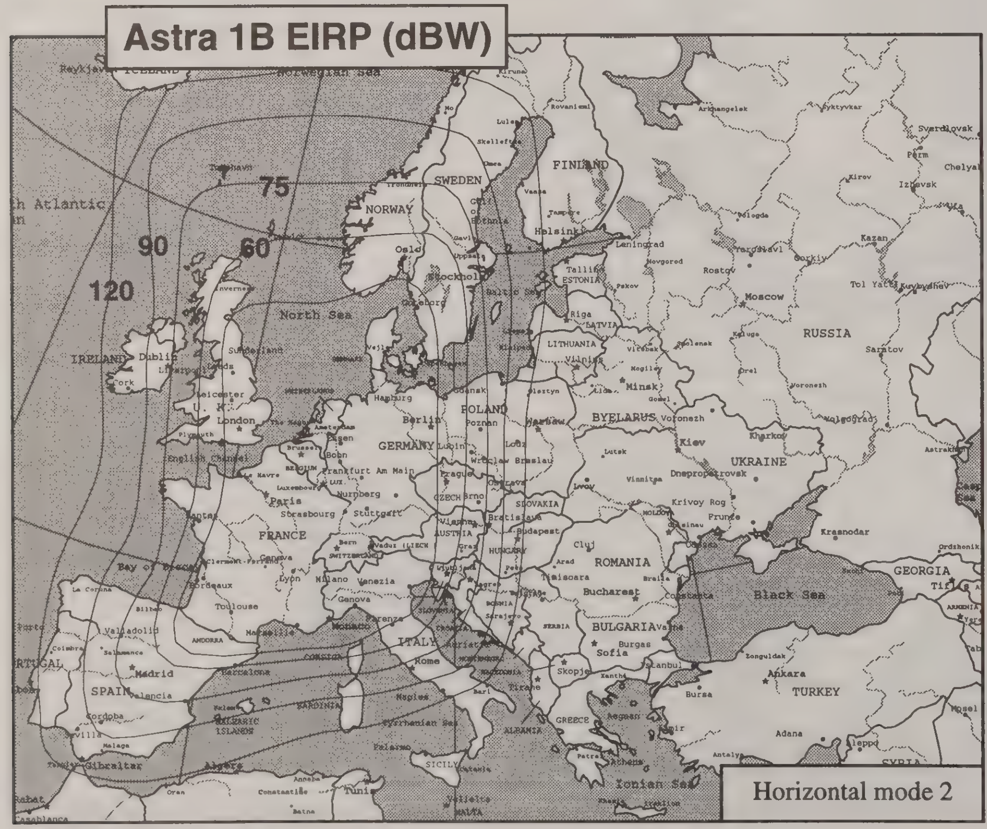


Horizontal mode 2



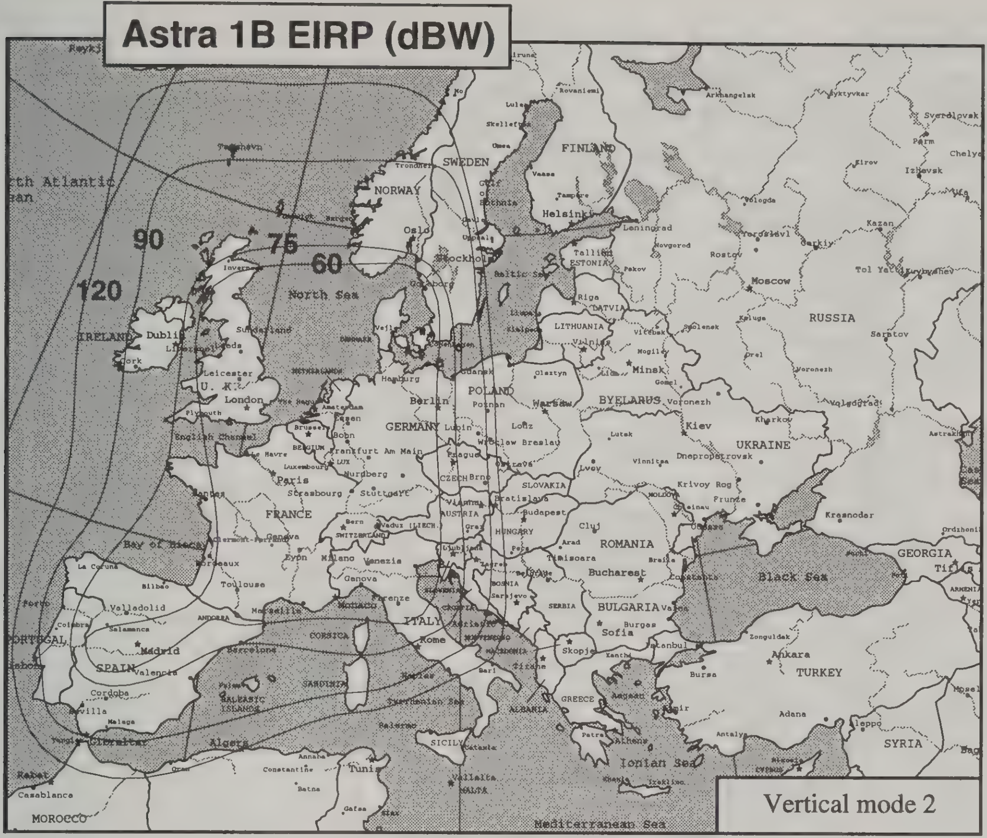
Astra 1A EIRP (dBW)

Vertical mode 2

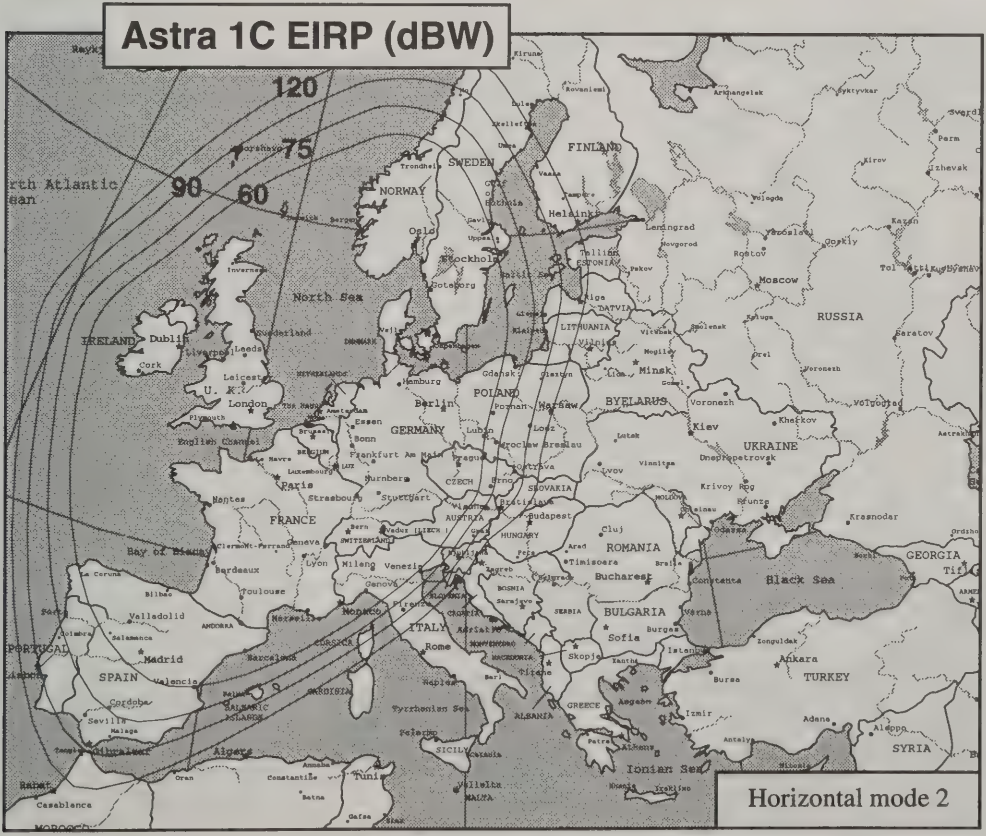


Astra 1B EIRP (dBW)

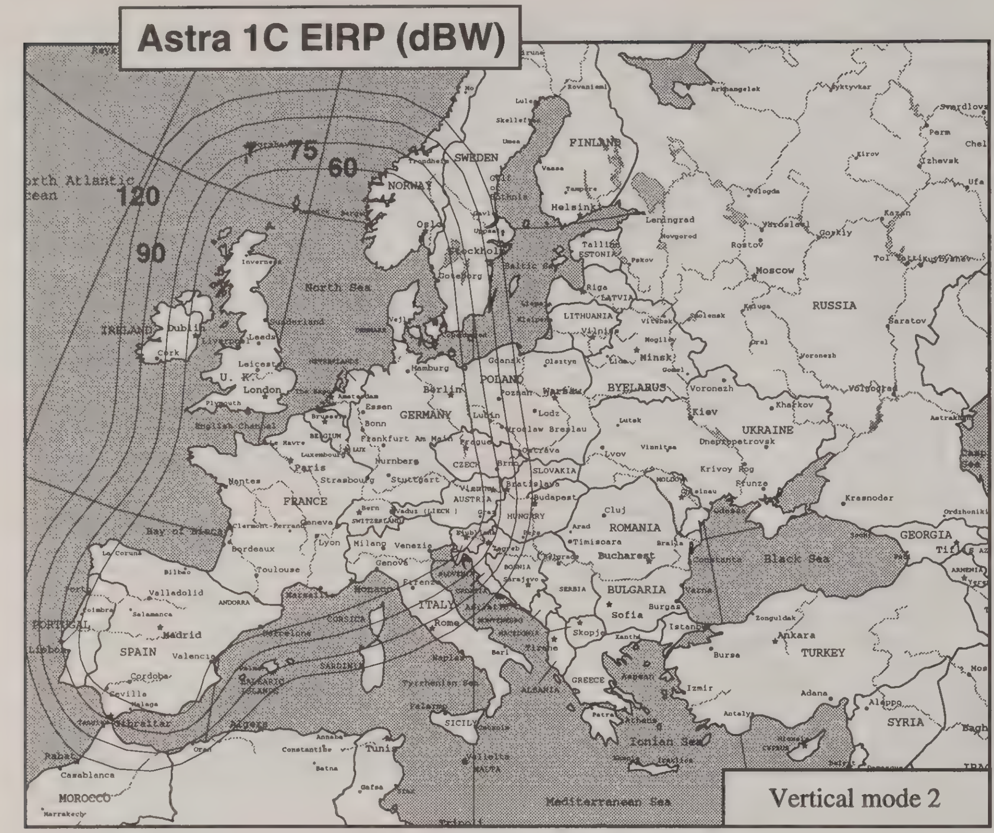
Horizontal mode 2



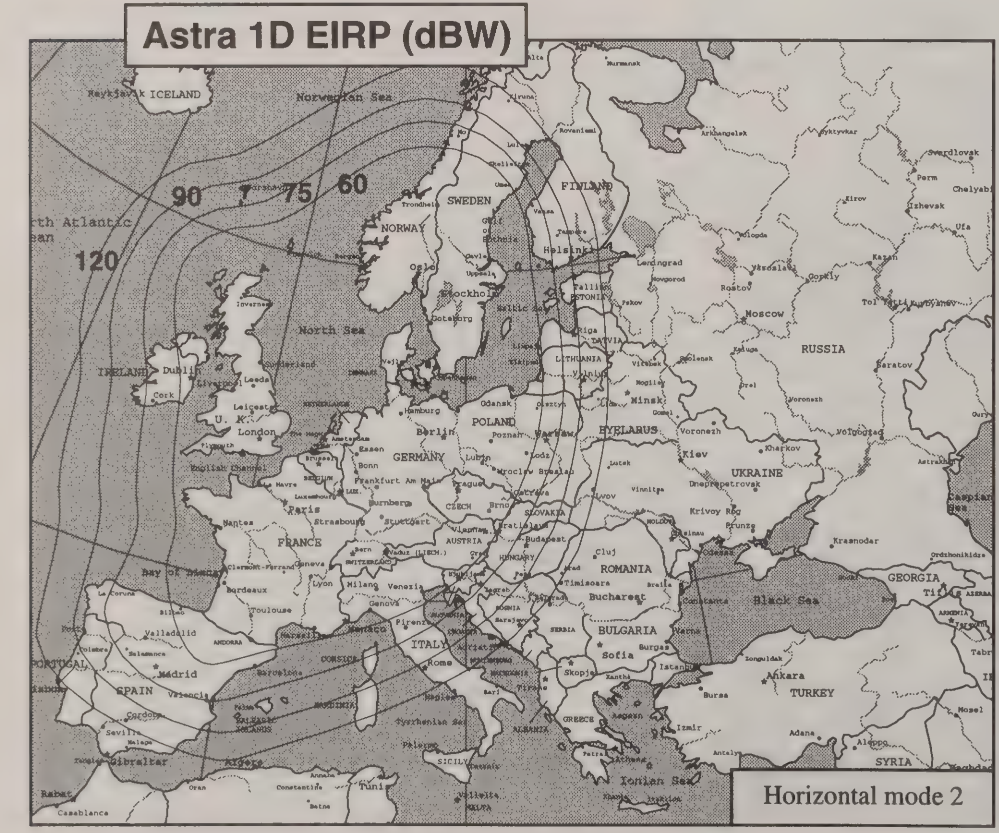
Astra 1B EIRP (dBW)



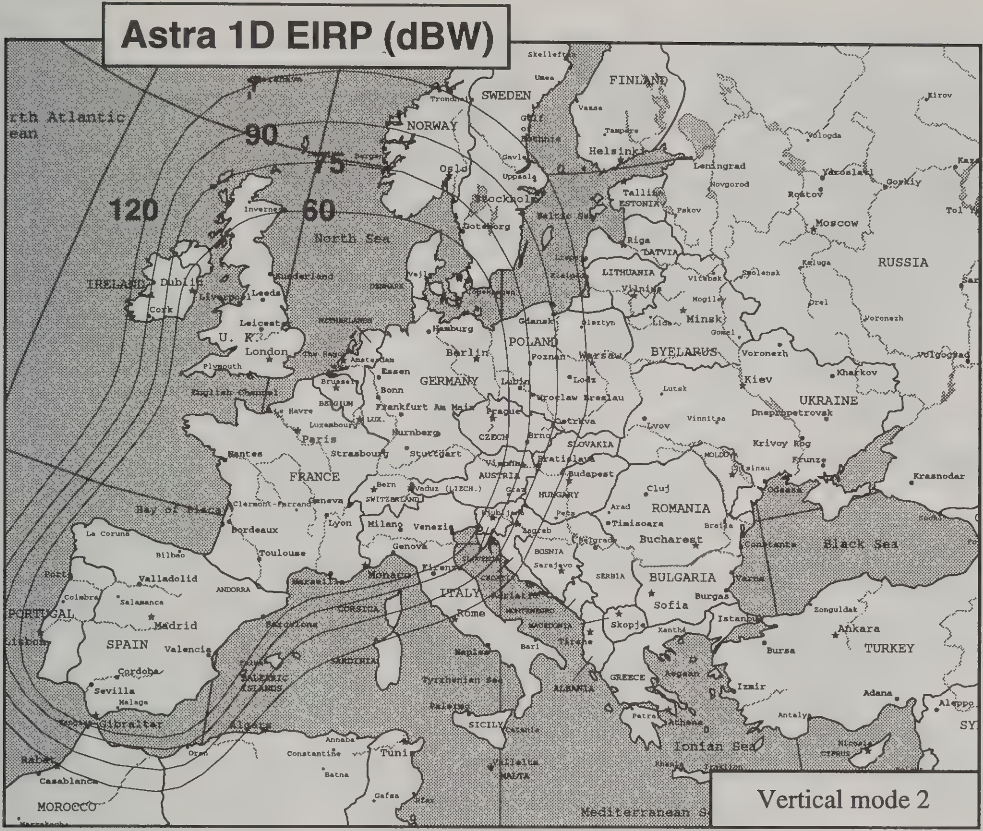
Astra 1C EIRP (dBW)



Astra 1C EIRP (dBW)

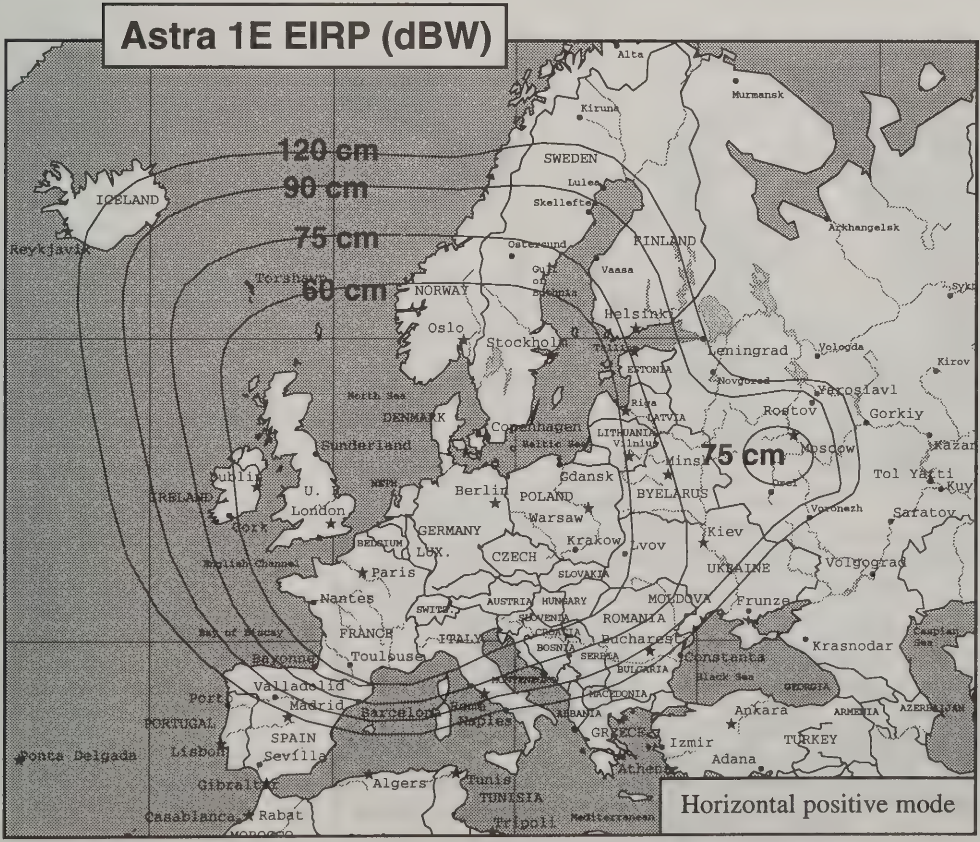


Astra 1D EIRP (dBW)



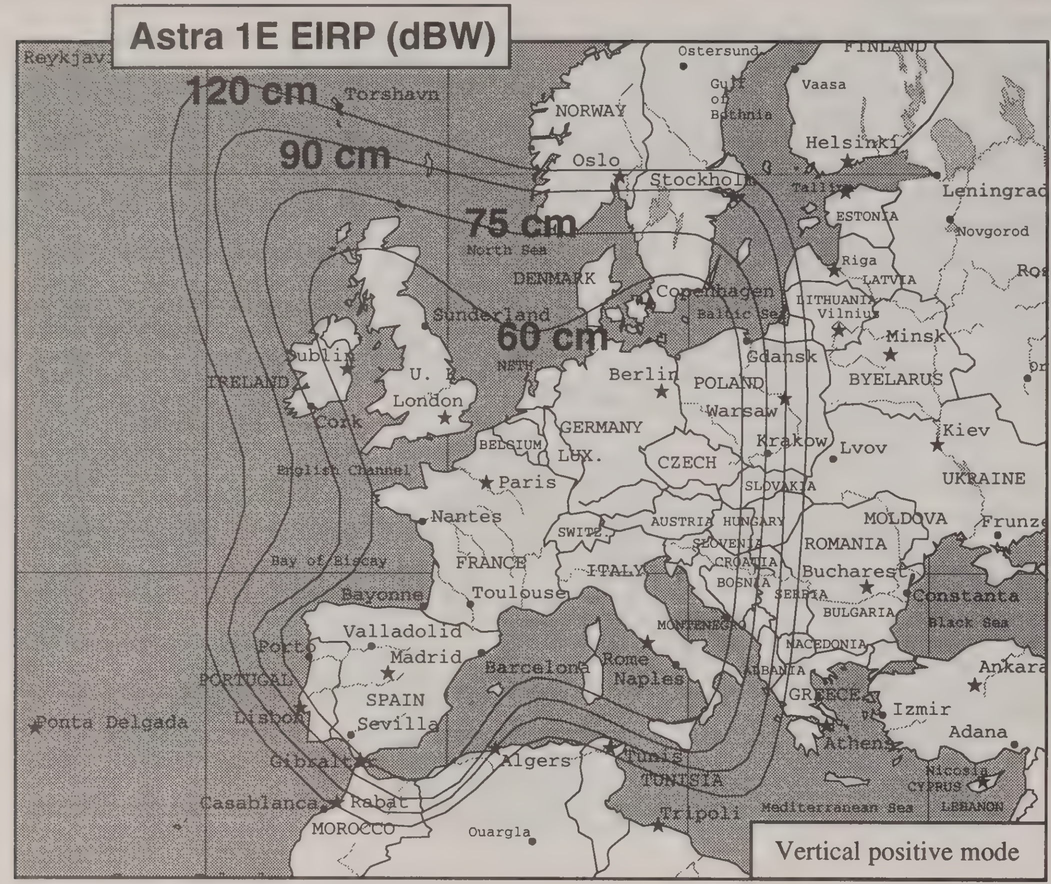
Astra 1D EIRP (dBW)

Vertical mode 2



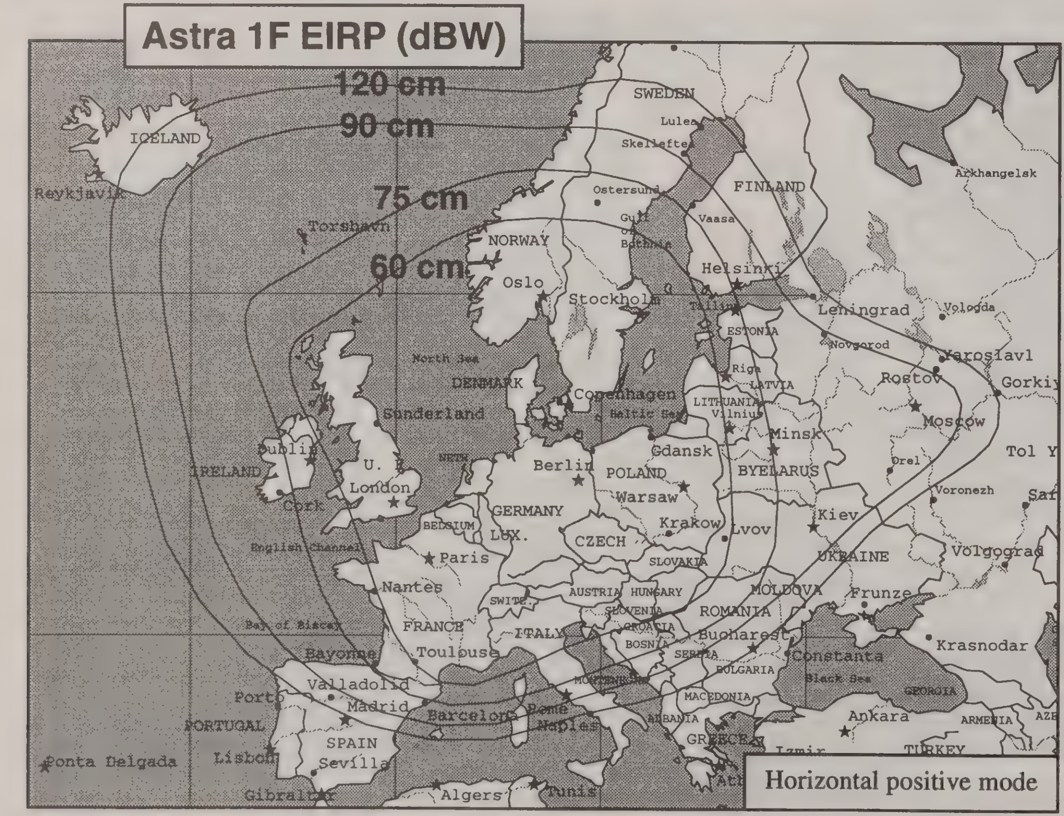
Astra 1E EIRP (dBW)

Horizontal positive mode



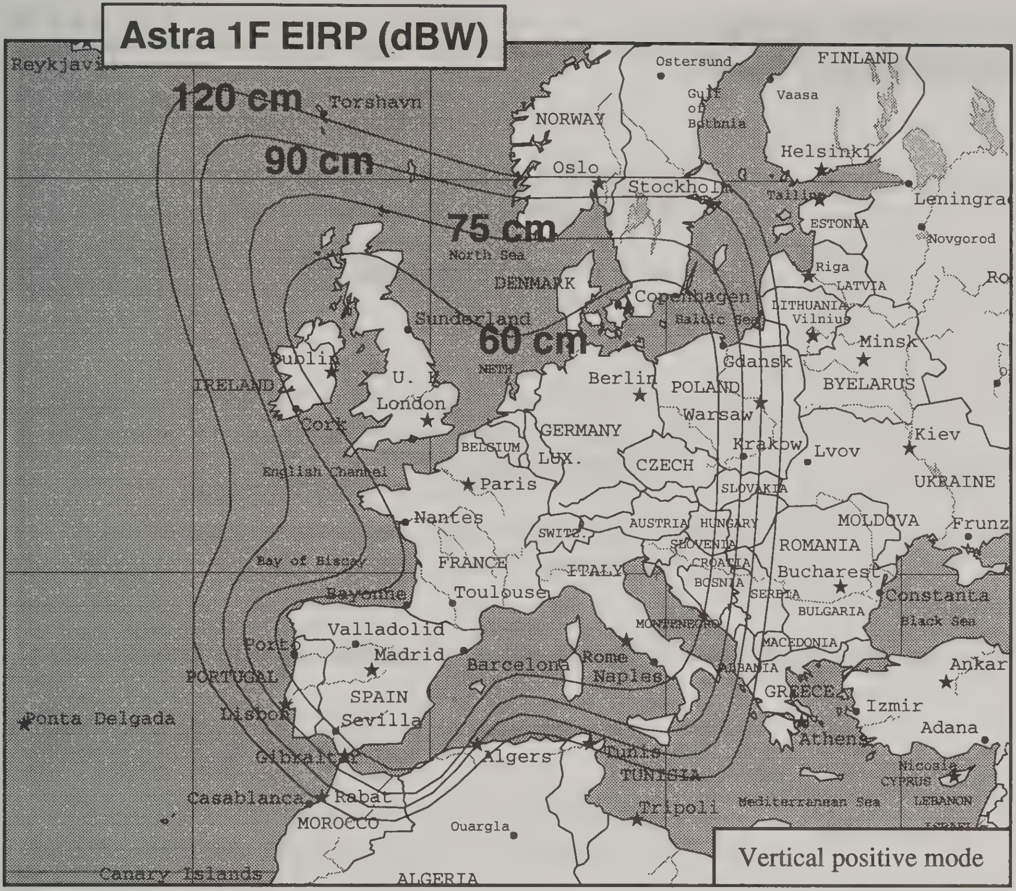
Astra 1E EIRP (dBW)

Vertical positive mode



Astra 1F EIRP (dBW)

Horizontal positive mode


Astra 1F EIRP (dBW)
120 cm
90 cm
75 cm
60 cm
Vertical positive mode
Reykjavik
Torshavn
NORWAY
Oslo
Ostersund
Gulf of Bothnia
FINLAND
Vaasa
Helsinki
Stockholm
Tallinn
ESTONIA
Leningrad
Novgorod
Riga
LATVIA
North Sea
DENMARK
Copenhagen
LITHUANIA
Vilnius
Baltic Sea
Sunderland
Minsk
Dublin
IRELAND
U. K.
London
NETH
Berlin
POLAND
Gdansk
BYELARUS
Warsaw
Cork
BELGIUM
LUX.
GERMANY
Krakow
Lvov
Kiev
CZECH
English Channel
Paris
SLOVAKIA
UKRAINE
Nantes
SWITZ
AUSTRIA
HUNGARY
MOLDOVA
SLOVENIA
ROMANIA
Bay of Biscay
FRANCE
ITALY
CROATIA
BOSNIA
Bucharest
Constanta
Bayonne
Toulouse
SERBIA
BULGARIA
Black Sea
Valladolid
MONTENEGRO
Porto
Madrid
MACEDONIA
PORTUGAL
Barcelona
Rome
Naples
ALBANIA
SPAIN
GREECE
Izmir
Ponta Delgada
Lisbon
Sevilla
Athens
Adana
Gibraltar
Algers
Tunis
TUNISIA
Nicosia
CYPRUS
Casablanca
Rabat
Tripoli
Mediterranean Sea
LEBANON
MOROCCO
Ouargla
Canary Islands
ALGERIA

ASTRA 2 SYSTEM At A Glance

Satellite name:	Astra 2A, 28.2°E (to be launched); Astra 2B, 28.2°E (to be launched)
Spacecraft data:	
Launch date:	August 1997 (2A); Late 1998 (2B)
Launch vehicle:	Ariane (2A); TBD (2B)
Transponders:	
Number:	28 Ku-band transponders (32 for the first 5 years) [2A]; 28 Ku-band transponders (30 for the first 5 years) [2B]
Power output:	100 W (2A); 108 (2B)
Manufacturer:	Hughes Space and Communications (2A); Matra Marconi Space (2B)

TURK TELECOM — SATCOM DEPARTMENT

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TURKEY

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Contact:

Tufan Yuruc, Director of Satcom Department

Booking Contact:

Ahmet Cengiz, Chief Engineer

Public Relations Contact:

Cem Bilsel, Project Responsibles of Turksat
Onur Karavelioglu, Project Responsibles of Turksat

Overview:

The Turksat system provides telephony, television and VSAT video links to Turkey, Central Europe and a zone in Central Asia where Turkish languages are spoken. On January 24, 1994, Turksat 1, the first satellite in the Turksat system, was lost when the Arianespace rocket carrying it suffered a major launch failure.

Services Offered:

- Analog and Digital TV
- Radio
- Broadcasting
- VSAT
- IBS

Satellite Control:

Satellite control:	Golbari, Odtu

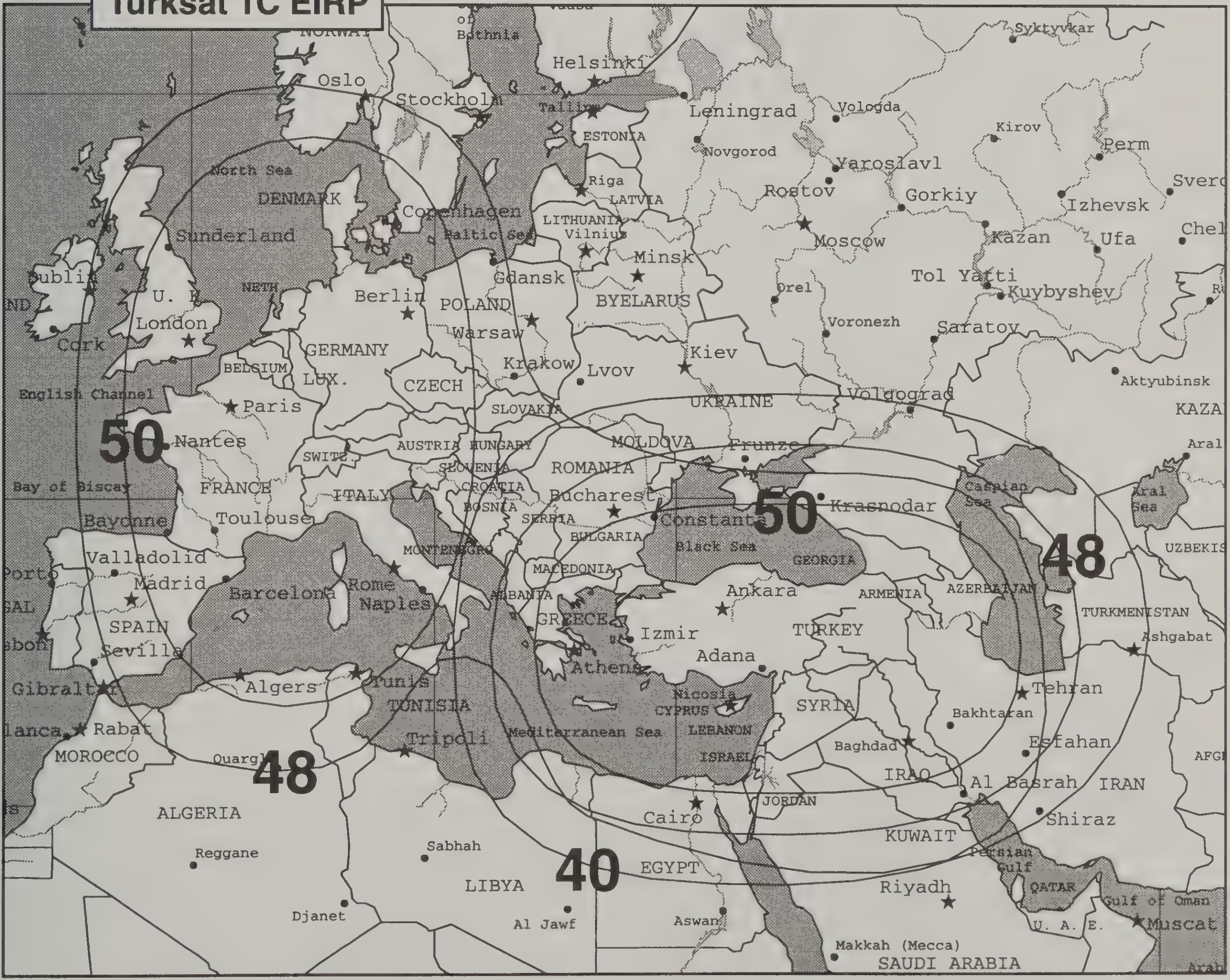
TURKSAT SYSTEM At A Glance

Satellite name:	Turksat 1B, 31.3°E; Turksat 1C, 42°E
Spacecraft data:	
Area of coverage:	Turkey, Western Europe and a zone to the east of Turkey
Mass (beginning of life):	1,070 kg
Primary power (EOL):	2,900 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	August 11, 1994 (1B); July 10, 1996 (1C)
Launch vehicle:	Ariane 4
Expected lifetime:	12 years
Transponders:	
Number:	16
Power output:	55 W TWTA
Polarization:	Linear
Uplink frequency:	14.0-14.5 GHz
Downlink frequency:	10.95-11.20 GHz, 11.45-11.70 GHz
EIRP:	56 dBW (1B) 54 dBW (1C)
Redundancy:	12:8
Single carrier saturation flux density:	-92 (1B); -90 (1C)
Manufacturer:	Aerospatiale

Turksat 1C

Orbital location:	42°E
Launch:	July 10, 1996, Ariane 4
Expected lifetime:	12 years
Expected end of life:	2008
Antennas beam coverage overview:	Turkey, Western Europe and a zone to the east of Turkey

Turksat 1C EIRP



OPERATIONAL INTERNATIONAL NETWORKS

COLUMBIA COMMUNICATIONS CORPORATION

7200 Wisconsin Avenue
Suite 701
Bethesda, MD 20814
USA

Telephone:	(301)907-8800
	(800)418-3777
Facsimile:	(301)907-2420
Web Site Address:	tdrss.com
Corporate E-mail:	columbia@tdrss.com

Contact:

Blair Marshall, Satellite Sales Executive

Overview:

With 12 transponders on each of two NASA tracking and data relay satellite system satellites located at 319°E (41°W) in the Atlantic and 185.7°E (174.3°W) in the Pacific, Columbia can provide its customers single-system connectivity stretching from the Philippines north to Hong Kong, Taiwan, China, Japan, Korea, and the Russian Far East, across the Pacific and throughout North America, crossing the Atlantic and covering all of Europe, including Eastern Europe and the Mediterranean. The footprints of the two TDRS satellites overlap in the central United States.

Services Offered:

- Video
- Private line voice and data
- Public switched network (PSN) interconnection
- Custom bandwidth applications
- East and west beams operate in broadcast mode simultaneously
- Non-preemptible geostationary capacity

Satellite Control Network:

Satellite control:	Teleport Denver
TT&C stations:	White Sands, NM

International Gateway Earth Stations:

TDRS-4:	Atlanta International Teleport, Douglasville, GA Blocktown Satellite Uplink, Fabius, NY Caribsat, San Juan, PR Crescomm Transmission, Holmdel, NY Dallas/Fort Worth Teleport, Irving, TX Micronet, Glenwood, NJ Pittsburgh International Teleport, Pittsburgh, PA Southwest Micronet Inc., Dallas, TX Teleport Denver, Denver, CO Teleport London International, Chalfont Grove, United Kingdom Washington International Teleport, Alexandria, VA
TDRS-5:	Associated Communications International, Los Angeles, CA Brewster International Gateway, Brewster, WA Hong Kong Telecom, Hong Kong KDD, Tokyo, Japan MCI Telcommunications, Yacolt, WA Teleport Denver, Denver, CO

COLUMBIA/TDRS SYSTEM At A Glance

Satellite name:	TDRS-4, 319°E (41°W); TDRS-5, 186°E (174°W); TDRS-6, 313°E (47°W)
Spacecraft data:	
Mass (in orbit):	2,400 kg
Primary power (EOL):	1,700 W
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	March 1989 (4); August 1991 (5); January 13, 1993 (6)
Expected lifetime:	10 years (4 and 5); 7 years (6)
Transponders:	
Number:	12
Power output:	5.5 W TWTA
Polarization:	Linear
G/T:	-2.7 dB/K
Single carrier saturation flux density:	-86.4 dBW/sq.m.
Manufacturer:	TRW

TRDS C-Band Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	Linear	36	36.2	5.945	3.720
2	Linear	36	36.2	5.985	3.760
3	Linear	36	36.2	6.025	3.800
4	Linear	36	36.2	6.065	3.840
5	Linear	36	36.2	6.105	3.880
6	Linear	36	36.2	6.145	3.920
7	Linear	36	36.2	6.185	3.960
8	Linear	36	36.2	6.225	4.000
9	Linear	36	36.2	6.265	4.040
10	Linear	36	36.2	6.305	4.080
11	Linear	36	36.2	6.345	4.120
12	Linear	36	36.2	6.385	4.160

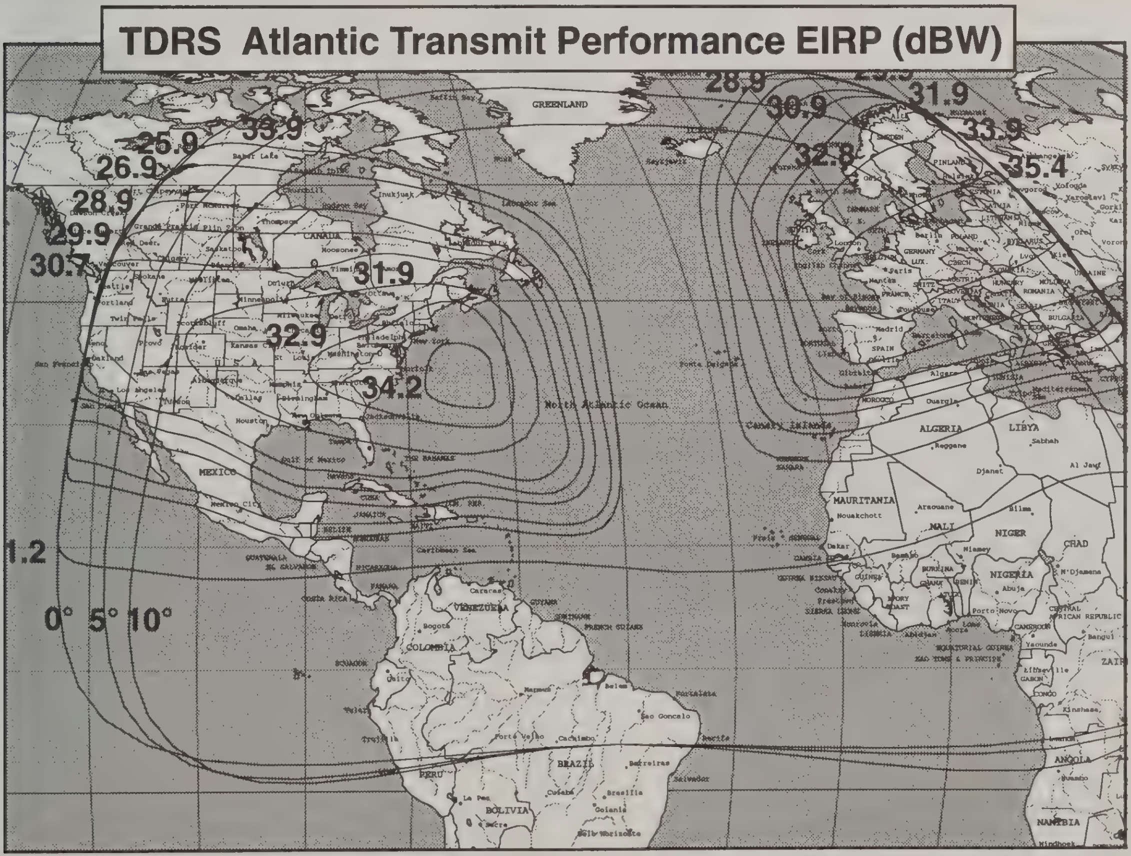
TDRS-4, TDRS-5 and TDRS-6

Orbital location:	319°E (41°W) [TDRS-4], 186°E (174°W) [TDRS-5], 313°E (47°W) [TDRS-6]
Launch:	March 1989, STS/IUS (TDRS-4), August 1991, STS/IUS (TDRS-5), January 13, 1993, Shuttle (TDRS-6)
Expected lifetime:	10 years (TDRS-4 and TDRS-5), 7 years (TDRS-6)
Expected end of life:	1999 (TDRS-4), 2001 (TDRS-5), 2000 (TDRS-6)

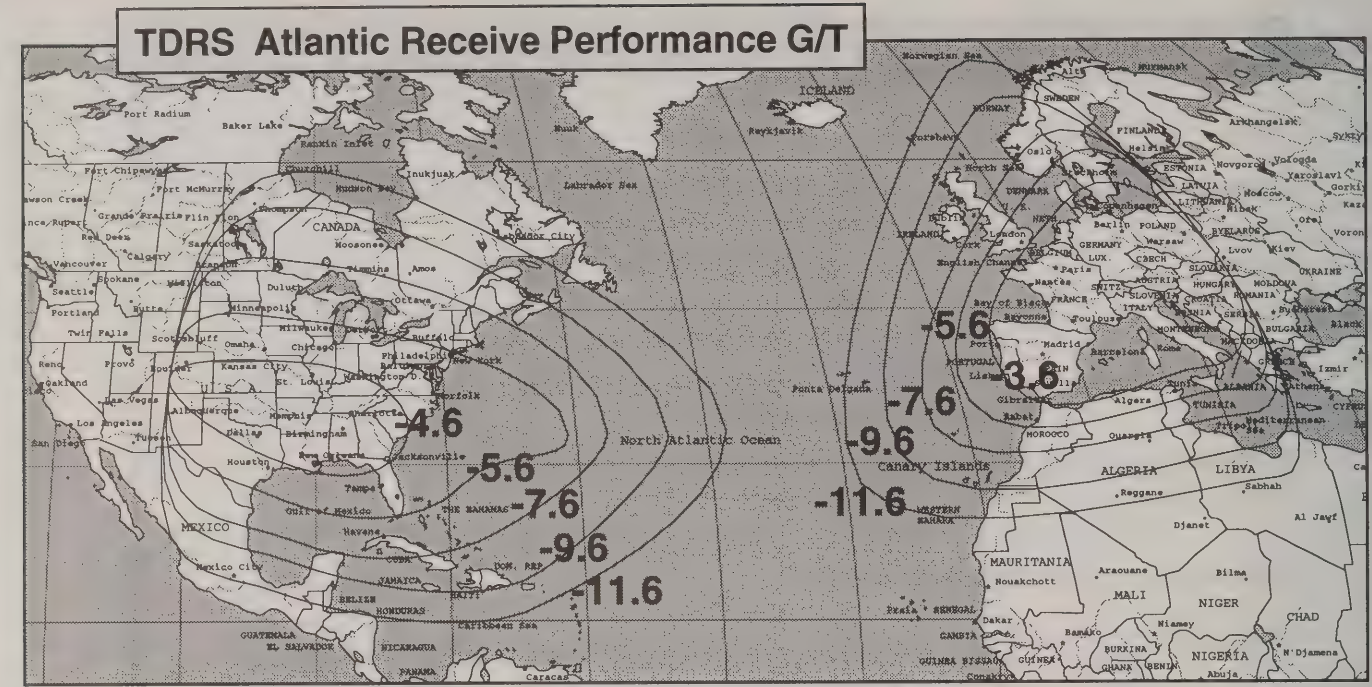
Antennas beam coverage overview:

C-band:	Caribbean, China, Europe, Hong Kong, Philippines, Taiwan, Japan, Korea, Mediterranean, Northern Africa, North America, Russian Far East (TDRS-5)

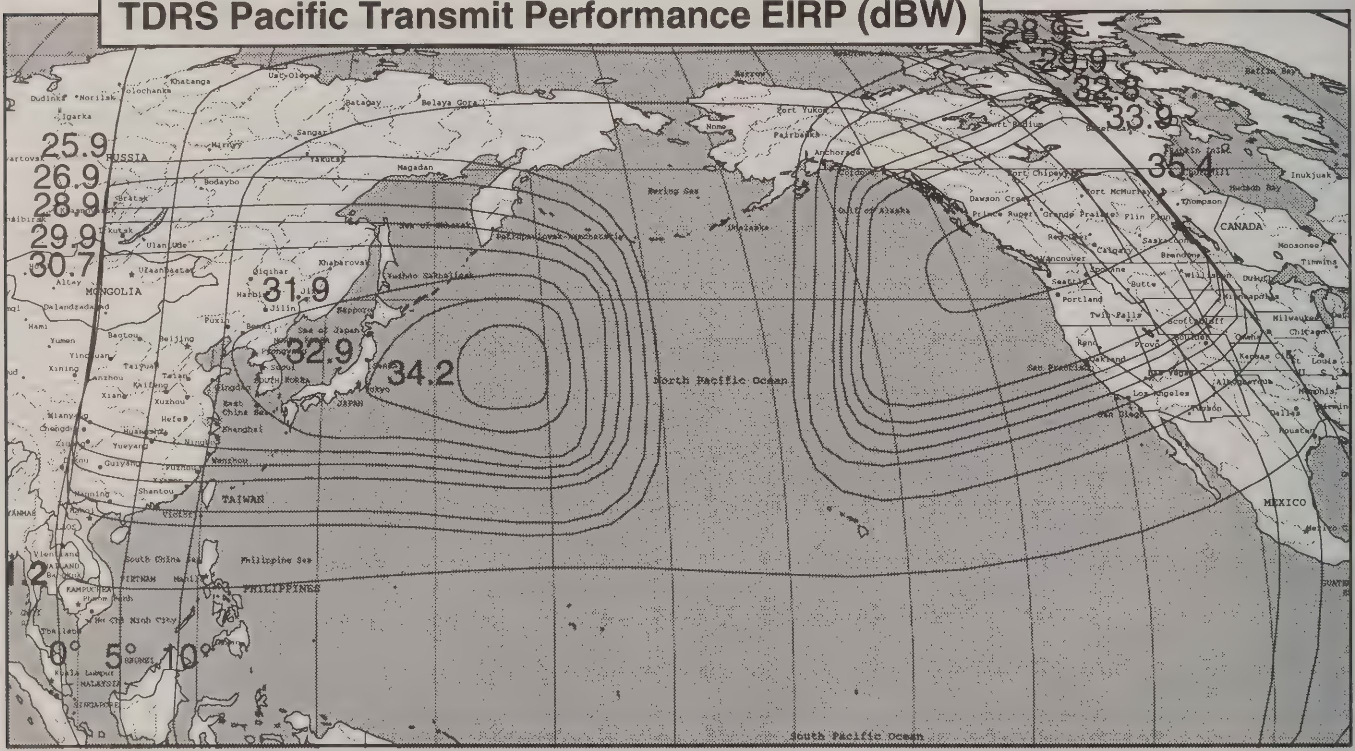
TDRS Atlantic Transmit Performance EIRP (dBW)

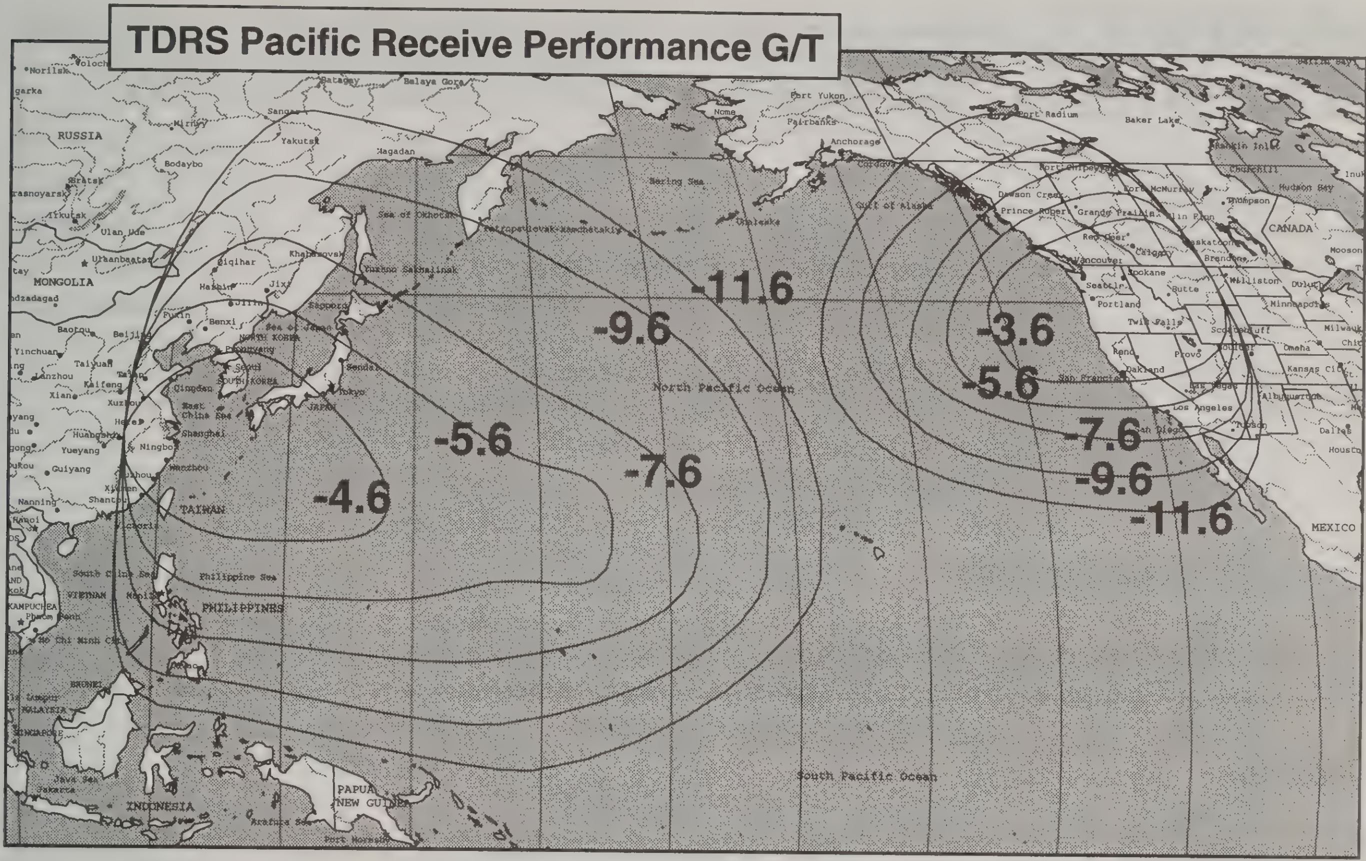


TDRS Atlantic Receive Performance G/T



TDRS Pacific Transmit Performance EIRP (dBW)





TDRS Pacific Receive Performance G/T

INMARSAT
(INTERNATIONAL MOBILE SATELLITE ORGANIZATION)

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UNITED KINGDOM

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Telex:	297201 INMSAT G
Web Site Address:	www.inmarsat.org/

Contacts:

Gavin Trevitt, Business Communications Manager

Public Relations Contacts:

Elizabeth Hess, Head of Press Relations
Caroline Chalumeau, Director of Corporate Communications

Overview:

Established in 1979 to serve the maritime community, Inmarsat is now the world's largest provider of global mobile satellite communications for commercial and distress and safety applications, at sea, in the air and on land. To provide its services, Inmarsat uses its own Inmarsat-2 satellites and leases the Marecs B2 satellite from the European Space Agency, maritime communications subsystems (MCS) on several Intelsat V satellites, and capacity on 3 Marisat satellites from Comsat.

Services Offered:

- Direct-dial telephone, telex, facsimile, electronic mail, and data connections for maritime applications
- Flight deck voice and data
- Automatic position and status reporting and direct-dial passenger telephone, facsimile and data services for aircraft
- Two-way data communications, position reporting, electronic mail and fleet management for land transport
- Two-way telephone services via transportable and portable terminals

Inmarsat Member Countries

Country	Signatory	Investment share %
Algeria	Ministére des Postes et Télécommunications	0.07321
Argentina	Comision Nacional de Telecomunicaciones	0.30138
Australia	Telstra Corporation Ltd.	1.11370
Bahamas	Bahamas Telecommunication Corporation (Batelco)	0.05000 (prov)
Bahrain	Ministry of Transportation	0.13165
Bangladesh	Bangladesh Telegraph and Telephone Board (T&T Board)	0.05000
Belgium	Belgacom	0.93395
Brazil	Empresa Brasileira de Telecomunicacoes SA (Embratel)	0.97002
Brunei	Telecommunications Department	0.05000
Bulgaria	Navigation Maritime Bulgare Ltd.	0.13664
Cameroon	International Telecommunications Organisation of Cameroon (Intelcam)	0.05000
Canada	Teleglobe Canada Inc.	2.71619
Chile	Empresa Nacional de Telecomunicaciones SA (Entel-Chile)	0.06539
China	Beijing Marine Communications and Navigation Company	0.69671
Colombia	Empresa Nacional de Telecomunicaciones (Telecom)	0.05000
Croatia	Ministry of Maritime Affairs	0.05390
Cuba	Ministerio de Comunicaciones	0.05000
Cyprus	Cyprus Telecommunications Authority (CYTA)	1.26290
Czech Republic	Ministry of Economy	0.07344
Denmark	Tele Danmark A/S	2.18328
Egypt	National Telecommunications Organization (Arento)	0.31464
Finland	Telecom Finland	0.49777
France	France Telecom	5.24263
Gabon	Telecommunications Internationales Gabonaises (TIG)	0.05000
Georgia, Republic of	Ministry of Communications	0.05000
Germany	Deutsche Bundespost Telekom	4.58274
Greece	Hellenic Telecommunications Organization (OTE)	3.12830
Iceland	Posts and Telecommunications Administration	0.05000
India	Videsh Sanchar Nigam Ltd.	0.68173
Indonesia	PT Indonesian Satellite Corporation (PT Indosat)	0.25323
Iran	Telecommunication Company of Iran	0.21145
Iraq	Iraqi Telecommunications and Posts	0.05000
Israel	Ministry of Communications	0.10232
Italy	Telespazio SpA	2.64756
Japan	Kokusai Denshin Denwa Company Ltd.	9.00604
Korea, Republic of	Korea Telecom	1.13366
Kuwait	Ministry of Communications	0.29166
Liberia	Bureau of Maritime Affairs	0.17550

Inmarsat Member Countries (Continued)

Country	Signatory	Investment share %
Malaysia	Telekom Malaysia Berhad	0.18036
Malta	Telemalta Corporation	0.07446
Mauritius	Mauritius Telecom Ltd.	0.05000
Mexico	Telecomunicaciones de Mexico (Telecomm)	0.09964
Monaco	Direction General des Postes et Telecommunications	0.05911
Mozambique	Empresa Nacional de Telecomunicacioes de Mozambique EE	0.05000
Netherlands	PTT Telecom Netherlands	4.62785
New Zealand	Telecom New Zealand International Ltd. (TNZI)	0.16264
Nigeria	Nigerian Telecommunications Ltd.	0.20476
Norway	Norwegian Telecom	7.83732
Oman	Ministry of Posts, Telegraphs and Telephones	0.05054
Pakistan	Pakistan Telecommunications Corporation	0.08899
Panama	Instituto Nacional de Telecomunicaciones (Intel)	0.13477
Peru	Empresa Nacional de Telecomunicaciones del Peru SA	0.05542
Philippines	Philippine Communications Satellite Corporation (Philcomsat)	0.16871
Poland	Telekomunikacja Polska SA	0.40518
Portugal	Companhia Portuguesa Radio Marconi	0.38929
Qatar	Qatar Public Telecommunication Corporation (Q-Tel)	0.06718
Romania	Ministry of Communications	0.05000
Russian Federation*	Morsviazsputnik	4.42911
Saudi Arabia	Ministry of Posts, Telegraphs and Telephones	1.29268
Senegal	Societe Nationale des Telecommunications due Senegal	0.05000
Singapore	Singapore Telecommunications Ltd.	1.93643
Slovak Republic	Ministry of Transport, Communications and Public Works of the Slovak Republic	0.05000
South Africa	Telkom SA Ltd.	0.26612
Spain	Telefonica de Espana SA	1.39589
Sri Lanka	Sri Lanka Telecom	0.05000
Sweden	Telia AB	0.89993
Switzerland	Swiss Telecom PTT	0.99787
Tunisia	Tunisian General Directorate Telecommunications	0.05000
Turkey	General Directorate of Post, Telegraph and Telephone	0.16524
Ukraine	State Enterprise of Maritime Telecommunications (Morcom)	0.05000 (prov)
United Arab Emirates	Ministry of Communications	0.51129
United Kingdom	British Telecom plc.	11.14436
USA	Comsat Corporation	22.35140
Yugoslavia	Community of Yugoslav Posts, Telegraphs and Telephones	0.12187

*Includes initial investment shares of Belarus

Coast Earth Stations

Inmarsat-A

Country	Location	Operator	Coverage Region	Access Code	
				(Octal)	(Decimal)
Australia	Gnangara	IDB Comms Group Inc.	IOR	13	11
Australia	Perth	Telstra	IOR/POR	02	02
Brazil	Tangua	Embratel	AORE	14	12
China	Beijing	Beijing Marine Coms. & Navs.	POR/IOR	11	09
Denmark, Finland, Iceland, Norway, Sweden	Eik	Norwegian Telecom	IOR/AORE/AORW	04	04
Egypt	Maadi	National Telecoms Organisation	AORE	15	13
France	Pleumeur Bedeu	France Telecom	AORW/AORE	11	09
Germany	Raisting	Fernmeldetechnisches Zentralamt	AORE	15	13
Greece	Thermopylae	OTE SA	IOR	05	05
India	Aarvi	Videsh Sanchar Nigam Ltd.	IOR	06	06
Iran	Boumehen	Telecomm Company of Iran	IOR	14	12
Italy	Fucino	Telespazio	AORE	05	05
Japan	Yamaguchi	Kokusai Denshin Denwa	POR/IOR	03	03
Korea, Republic of	Kumsan	Korea Telecom Authority	POR	04	04
Netherlands	Burum	PTT Nederland NV	AORE/IOR	12	10
Poland	Psary	Ministry Transp./Marit. Economy	AORE/IOR	16	14
Russia	Nakhodka	Morsviazsputnik	POR	12	10
Saudi Arabia	Jeddah	Ministry of PTT	IOR	15	13
Singapore	Sentosa	Telecom Authority of Singapore	POR	10	08
Turkey	Anatolia	Comsat Mobile Communications	IOR	01	01
Turkey	Ata	General Directorate of PTT	IOR/AORE	10	08
UK	Goonhilly	BT International	AORW/AORE	02	02
Ukraine	Odessa	Morsviazsputnik	AORE/IOR	07	07
USA	Niles Canyon	IDB Comms. Group Inc.	POR/AORW	13-1	11-1
USA	Santa Paula	Comsat Mobile Communications	POR	01	01
USA	Southbury	Comsat Mobile Communications	AORW/AORE	01	01
USA	Staten Island	IDB Comms Group Inc.	AORE	13-1	11-1

Inmarsat-C

Country	Location	Operator	Coverage Region	Access Code
Australia	Perth	Telstra	IOR/POR	302/202
Brazil	Tangua	Embratel	AORE	114
Denmark, Finland, Iceland, Norway, Sweden	Blaavand	Telecom Denmark	AORE	131
Denmark, Finland Iceland, Norway, Sweden	Eik	Norwegian Telecom	IOR	304
France	Plemeur Bodou	France Telecom	AORW/AORE	011/111
Germany	Raisting	Fernmeldetechnisches, Zentralamt	AORE	115
Netherlands	Burum	PTT Nederland NV	AORE/IOR	112/312
Singapore	Sentosa	Telecom Authority of Singapore	POR	210
UK	Goonhilly	BT International	AORW/AORE	002/102
USA	Santa Paula	Comsat Mobile Communications	POR	201
USA	Southbury	Comsat Mobile Communications	AORW/AORE	001/101

KEY

AORE: Atlantic Ocean Region East
AORW: Atlantic Ocean Region West
IOR: Indian Ocean Region
POR: Pacific Ocean Region

Coast Earth Stations (Continued)

Planned for Inmarsat-A and C

Country	Location	Operator	Coverage Region	System (A/C)
Argentina	Balcarce	Comision Nacional de Telecom	AORE	A
China	Beijing	Beijing Marine Coms. & Nav. Co.	POR/IOR	C
Cuba	N/A	Ministry of Communications	AOR	A
Greece	Thermopylae	OTE SA	IOR	C
India	Aarvi	Videsh Sanchar Nigam Ltd.	IOR	C
Iran	Boumehen	Telecomm Co. of Iran	IOR	C
Italy	Fucino	Telespazio	AORE	C
Korea, Republic	Kumsan	Korea Telecom Authority	IOR/POR	A/C
Kuwait	Umm-al-Aish	Ministry of Communication	AOR	A
Iceland, Norway, Sweden, Denmark, Finland	Eik	Norwegian Telecom	AORW	A
Poland	Psary	Ministry Transp. Marit. Economy	IOR	C
Portugal	Lisbon	Comp. Portuguesa Radio Marconi	AORE	C
Russia	Nakhodka	Morsviazsputnik	POR	C
Saudi Arabia	Jeddah	Ministry of PTT	AORE/IOR	A/C
Singapore	Sentosa	Telecom Authority of Singapore	IOR	C
Spain	Buitrago	Telefonica de Espana SA	AORE	A/C
Turkey	Ata	General Directorate of PTT	IOR	C
Ukraine	Odessa	Morsviasputnik	AORE/IOR	C

KEY

AORE: Atlantic Ocean Region East
AORW: Atlantic Ocean Region West
IOR: Indian Ocean Region
POR: Pacific Ocean Region

INMARSAT-2 SYSTEM At A Glance

Satellite name: .... Inmarsat-2 F1, 64.4°E;
Inmarsat-2 F2, 344.5°E (15.5°W);
Inmarsat-2 F3, 178°E;
Inmarsat-2 F4, 306°E (54°W)

Spacecraft data:
- Mass (in orbit): .... 800 kg
- Stabilization: 3-axis
- Primary power (EOL): .... 1,200 W
- Launch date: .... October 30, 1990 (F1); March 8, 1991 (F2); December 16, 1991 (F3); April 15, 1992 (F4)
- Launch vehicle: .... Delta II (F1, F2); Ariane (F3, F4)
- Expected lifetime: .... 10 years

Transponders:
- Satellite-shore frequencies:
  - Uplink: .... 6.425-6.443 GHz
  - Downlink: .... 3.600-3.623 GHz
  - Satellite EIRP: .... 24.0 dBW global coverage
- Satellite-ship frequencies:
  - Uplink: .... 1.6265-1.6495 GHz
  - Downlink: .... 1.530-1.548 GHz
  - Satellite EIRP .... 37.7 dBW (beam edge), 39.0 dBW (beam center)

Manufacturer: .... British Aerospace

INMARSAT- 3 SYSTEM At A Glance

Satellite name:	Inmarsat-3 F1, 64°E; Inmarsat-3 F2, 344.5°E (15.5°W); Inmarsat-3 F3, 178°E; Inmarsat-3 F4*
Spacecraft data:	
Mass (on orbit, BOL):	1,133 kg
Stabilization:	3-axis
Primary power (EOL):	2,800 W
Eclipse protection:	All transponders
Launch date:	April 3, 1996 (F1); September 6, 1996 (F2); December 17, 1996 (F3); May 1997 (F4)
Launch vehicle:	Proton (F2); Atlas 2A (F3, F4)
Expected lifetime:	13 years
Transponders:	
Number:	L-band matrix array generating 1 global beam, 5 spot beams and global GPS/Glonass overlay; 2 C-band
Power output:	22.5 W SSPA (L-band), 12 W SSPA (C-band)
Polarization:	Circular (L-band), dual circular (C-band)
Uplink frequency:	1.63-1.66 GHz (L-band); 6.43-6.45 GHz (C-band)
Downlink frequency:	1.53-1.56 GHz (L-band); 3.60-3.63 GHz (C-band)
EIRP:	48 dBW (L-band), 27 dBW (C-band)
Manufacturer:	Martin Marietta

* To be launched; orbital location to be determined

INTELSAT
(INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION)

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Telex:	892707

Booking Contact:

Intelsat Operations Center, (202)944-6781
Television Service Center (TVSC), (202)944-6797

Public Relations Contact:

Tony Trujillo, Corporate and Marketing Communications Director, (202)944-7500

Overview:

Intelsat owns and operates the world's most extensive global communications satellite system. With 1995 revenues of over U.S. $805 million, the Intelsat system provides transoceanic, regional and domestic telephone and television services. It also offers, via a 24-satellite global system, business services such as international video, teleconferencing, facsimile, data, and telex.

Services Offered:

- Broadcasting: occasional-use (minimum ten minutes), short-term and long-term full-time leases
- IDR: a digital public switched service compatible with evolving standards for the integrated services digital network (ISDN); used for international public switched telephony and dedicated private digital networks
- TDMA (time division multiple access): ISDN-quality services used for international public switched telephony traffic of large volume
- IBS (Intelsat Business Service) and Intelnet: private network services for end-to-end wideband digital communications; full-time, part-time and occasional-use private line service at transmission rates up to 8.448 megabits per second.
- Intelnet: Intelsat's primary VSAT service
- Multi-use leases: bulk leasing capacity for telephony, data and broadcasting, including 9 through 72 MHz units for C- and Ku-band capacity and a 150 MHz option for Ku-band services on VI-series satellites

Satellite Control:

TT&C stations:	Perth, Australia; Raisting, Germany; Fucino, Italy; Beijing, China; Clarksburg, MD, USA; Paumalu, HI, USA

Intelsat Earth Station Standards:

Earth Station Standard	Antenna Size in Meters	Types of Service	Frequency Band
A	15-18	Analog and digital public-switched, private (business) network, broadcasting	6/4
B	10-13	Analog and digital public-switched, private (business) network, broadcasting	6/4
C	11-14	Analog and digital public-switched, private (business) network, broadcasting	14/11
D1	4.5-6	Analog and digital public-switched, thin-route applications in remote areas	6/4
D2	11	Analog and digital public-switched, thin-route applications in remote areas	6/4
E1	3.5-4.5	Private (business) network	14/11 & 14/12
E2	5.5-7	Digital public-switched, private (business) network	14/11 & 14/12
E3	8-10	Digital public-switched, private (business) network	14/11 & 14/12
F1	4.5-5	Digital public-switched*, private (business) network services	6/4
F2	5.5-7	Digital public-switched, private (business) network services	6/4
F3	9-10	Analog and digital public-switched, private (business) network services	6/4
G	All sizes	International lease services	6/4, 14/11, 14/12
Z	All sizes	Domestic lease services	6/4, 14/11, 14/12

* Approved on a case-by-case basis.

Intelsat Member Countries

Country	Signatory	Investment Share%
Afghanistan	Ministry of Communications of the Islamic State of Afghanistan	0.050000
Algeria	Government of the Democratic and Popular Republic of Algeria	0.265411
Angola	Empresa Publica de Telecomunicacoes (EPTEL)	0.236120
Argentina	Comision Nacional de Telecomunicaciones	2.346509
Armenia	Ministry of Telecommunications	0.050000
Australia	Telstra Corporation Limited	2.822708
Austria	Government of Austria	0.406813
Azerbaijan	Ministry of Communication of Azerbaijan Republlic	0.050000
Bahamas	The Bahamas Telecommunication Corporation (Batelco)	0.103780
Bahrain	Bahrain Telecommunications Company	0.325624
Bangladesh	Telegraph and Telephone Board of Bangladesh	0.293684
Barbados	Barbados External Telecommunications Ltd.	0.050000
Belgium	Belgacom	0.343302
Benin	Office des Postes et Telecommunications de la Republique du Benin	0.084213
Bhutan	Department of Telecommunications, Ministry of Communications	0.050000
Bolivia	Empresa Nacional de Telecomunicaciones (Entel)	0.256283
Bosnia and Herzegovina	Government of the Republic of Bosnia and Herzegovina	*
Botswana	Botswana Telecommunications Corporation	0.050000
Brazil	Empresa Brasileira de Telecomunicacoes S.A. (Embratel)	1.411819
Brunei Darussalam	Department of Telecommunications, Ministry of Communications	0.152489
Bulgaria	Bulgarian Telecommunications Company Ltd. (BTC)	**
Burkina Faso	Office des Postes et Telecommunications du Burkina Faso	0.059930
Cameroon	Societe des Telecommunications Internationales du Cameroun (Intelcam)	0.124962
Canada	Teleglobe Canada Inc.	1.812952
Cape Verde	C.T.T. - Empresa Publica dos Correios e Telecomunicacoes	0.054931
Central African Republic	Government of the Central African Republic	0.050000
Chad	Societe des Telecommunications Internationales du Tchad (T.I.T.)	0.050000
Chile	Empresa Nacional de Telecomunicaciones S.A. (Entel)	1.513786
China	Ministry of Posts and Telecommunications of the People's Republic of China	2.159622
Colombia	Empresa Nacional de Telecomunicaciones de Colombia (Telecom)	1.308877
Congo	Government of the Republic of the Congo	0.050000
Costa Rica	Instituto Costarricense de Electricidad	0.050000
Cote d'Ivoire	Government of the Republic of Cote d'Ivoire	0.198837
Croatia	Ministry of Maritime Affairs, Transport and Communications	0.050000
Cyprus	Cyprus Telecommunications Authority	0.179101
Czech Republic	Ceske Radiokomunikace a.s.	0.080344
Denmark	Tele Danmark A/S	0.425242
Dominican Republic	Compania Dominicana de Telefonos, C.P.A.	0.289308
Ecuador	Empresa Estatal de Telecomunicaciones (Emetel)	0.423499
Egypt	Government of the Arab Republic of Egypt	0.599175
El Salvador	Administracion Nacional de Telecomunicaciones (Antel)	0.059287
Ethiopia	Ethiopian Telecommunications Authority	0.198973
Fiji	Fiji International Telecommunications Limited (Fintel)	0.054919
Finland	Telecom Finland Ltd.	0.085425

Intelsat Member Countries (Continued)

Country	Signatory	Investment Share%
France	France Telecom	3.664063
Gabon	Societe des Telecommunications Internationales Gabonaises (T.I.G.)	0.059491
Germany	Deutsche Telekom AG	3.458262
Ghana	Ministry of Transport and Communications	0.092401
Greece	Hellenic Telecommunications Organization S.A. (OTE)	0.373924
Guatemala	Empresa Guatemalteca de Telecomunicaciones "Guatel"	0.327036
Guinea	Societe des Telecommunications du Guinee (Sotelgui)	0.057900
Haiti	Telecommunications d'Haiti S.A.	0.139857
Honduras	Empresa Hondurena de Telecomunicaciones (Hondutel)	0.050000
Hungary	Hungarian Satellite Communications Association (Hunsat)	0.087714
Iceland	Post and Telecom Iceland	0.149439
India	Videsh Sanchar Nigam Limited	2.123524
Indonesia	PT Indosat	1.100000
Iran	Telecommunication Company of Iran	0.927245
Iraq	Government of the Republic of Iraq	0.211648
Ireland	The Irish Telecommunications Board	0.075156
Israel	The Israel Telecommunication Corporation Ltd. "Bezeq"	1.450853
Italy	Telecom Italia	4.871141
Jamaica	Telecommunications of Jamaica Limited	0.211997
Japan	Kokusai Denshin Denwa Company Ltd.	4.479609
Jordan	Government of the Hashemite Kingdom of Jordan	0.240953
Kazakhstan	Ministry of Transportation and Communication of the Republic of Kazakhstan	0.050000
Kenya	Kenya Posts and Telecommunications Corporation	0.325470
Korea, Republic of	Korea Telecom	1.86
Kuwait	The Ministry of Communications, The State of Kuwait	0.506129
Kyrghyz Republic	The Ministry of Communications of Kyrghyz Republic	0.050000
Lebanon	Government of Lebanon	0.157061
Libya	Government of the Great Socialist People's Libyan Arab Jamahiriya	0.147193
Liechtenstein	Government of the Principality of Liechtenstein	0.050000
Luxembourg	Government of Luxembourg	0.050000
Madagascar	Societe des Telecommunications Internationales de la Republique Malgache (Stimad)	0.050000
Malawi	The Department of Posts and Telecommunications of the Government of the Republic of Malawi	0.081470
Malaysia	Syarikat Telekom Malaysia Berhad	0.643219
Mali	Societe des Telecommunications du Mali (Sotelma)	0.074994
Malta	Telemalta Corporation	0.067239
Mauritania	Government of the Islamic Republic of Mauritania	0.050000
Mauritius	Mauritius Telecom Limited	0.117947
Mexico	Government of Mexico	0.416805
Micronesia	Federated States of Micronesia Telecommunications Corporation	0.050000
Monaco	Government of the Principality of Monaco	0.050000
Morocco	Office National des Postes et Telecommunications	0.163560
Mozambique	Empresa Nacionale de Telecomunicacoes de Mocambique	0.130694

Intelsat Member Countries (Continued)

Country	Signatory	Investment Share %
Namibia	Telecom Namibia (Ltd.)	0.050000
Nepal	Nepal Telecommunications Corporation	0.053640
Netherlands	PTT Nederland NV	1.410264
New Zealand	Telecom Corporation of New Zealand Ltd.	0.593553
Nicaragua	Instituto Nicaraguense de Telecomunicaciones y Correos (Telcor)	0.053943
Niger	Government of the Republic of Niger	0.074121
Nigeria	Nigerian External Telecommunications Limited	0.575518
Norway	Telenor Satellite Services AS	2.448200
Oman	Sultanate of Oman	0.239208
Pakistan	Government of the Islamic Republic of Pakistan	1.020447
Panama	Instituto Nacional de Telecomunicaciones S.A. (Intel)	0.050000
Papua New Guinea	Posts and Telecommunication Corporation of Papua New Guinea	0.067766
Paraguay	Administracion Nacional de Telecomunicaciones (Antelco)	0.204453
Peru	Empresa Nacional de Telecommunicaciones del Peru (Entel Peru)	0.997869
Philippines	Philippine Communications Satellite Corporation (Philcomsat)	0.716823
Poland	The Poland Telecommunications Company	0.099299
Portugal	Companhia Portuguesa Radio Marconi	0.707568
Qatar	Qatar Public Telecommunications Corporation (Q-Tel)	0.178856
Romania	Ministry of Posts and Telecommunications of Romania	0.084545
Russian Federation	Ministry of Communications of the Russian Federation	0.129182
Rwanda	Ministere des Transports et des Communications de la Republique Rwandais	0.050000
Saudi Arabia	Government of Saudi Arabia	1.086270
Senegal	Government of the Republic of Senegal	0.150000
Singapore	Singapore Telecommunications Private Limited	1.628805
Somalia	Ministry of Posts and Telecommunications of the Somali Democratic Republic	0.050000
South Africa	Telkom SA Ltd.	1.164039
Spain	Telefonica de Espana S.A.	1.579324
Sri Lanka	Government of Sri Lanka	0.297290
Sudan	Government of the Republic of the Sudan	0.104873
Swaziland	Posts and Telecommunications Corporation (Public)	0.050000
Sweden	Telia AB	0.546811
Switzerland	Direction Generale de l'Entreprise des Postes, Telephones et Telegraphes	0.839405
Syria	Government of the Syrian Arab Republic	0.140532
Tajikistan	Ministry of Communications, Public	0.050000
Tanzania	Tanzania Posts and Telecommunications Corporation	0.078279
Thailand	Government of Thailand	0.814064
Togo	Office des Postes et Telecommunications du Togo (OPTT)	0.123171
Trinidad and Tobago	Telecommunications Services of Trinidad & Tobago Limited (TSTT)	0.050000
Tunisia	Administration for Post, Telegraph and Telephone of Tunisia	0.050000
Turkey	Turk Telekomukasyon A.S. (Turk Telekom)	0.495982
Uganda	Ministry of Power, Post and Telecommunications of the Government of the Republic of Uganda	0.057617
United Arab Emirates	Ministry of Communications of the Government of the United Arab Emirates	1.060942

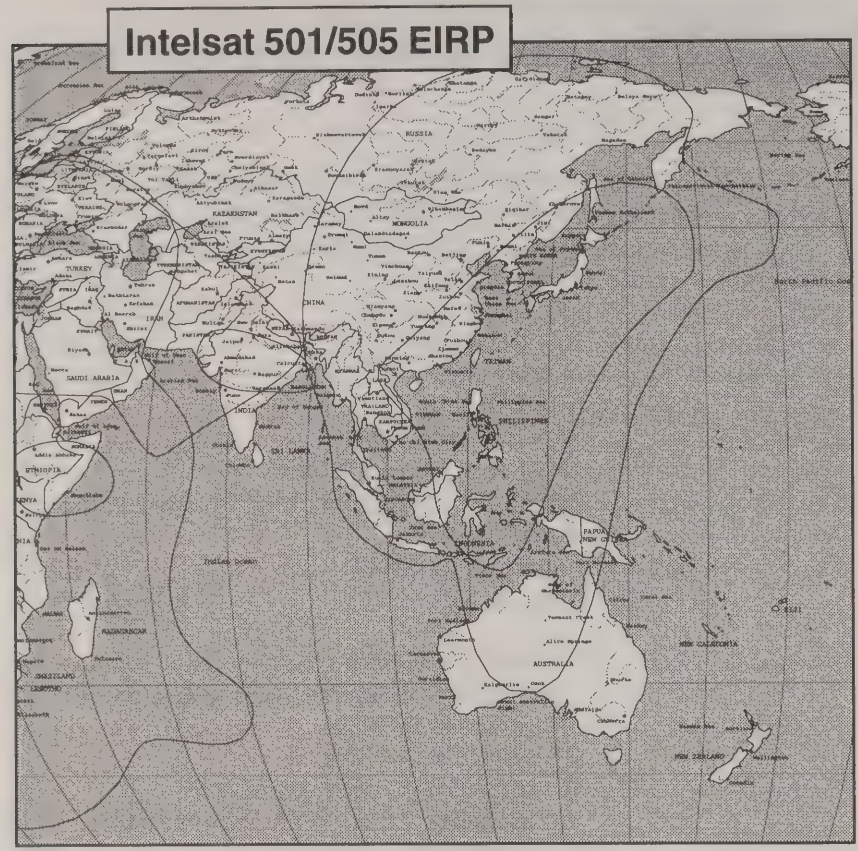
Intelsat Member Countries (Continued)

Country	Signatory	Investment Share %
United Kingdom	British Telecommunications Public Limited Company	9.195880
United States of America	Comsat Corporation of America	19.14819
Uruguay	Administracion Nacional de Telecomunicaciones (Antel)	0.052832
Vatican City State	Government of the Vatican City State	0.050000
Venezuela	Compania Anonima Nacional Telefonos de Venezuela (Cantv)	0.974968
Vietnam	Direction Generale des Postes et Telecommunications de la Republique Socialiste du Viet Nam	0.420322
Yemen	Government of the Republic of Yemen	0.266265
Yugoslavia	Community of the Yugoslav Posts, Telegraphs and Telephones	0.228729
Zaire	Office National des Postes et Telecommunications du Zaire (ONPTZ)	0.152131
Zambia	Government of the Republic of Zambia	0.122495
Zimbabwe	Government of Zimbabwe	0.050000

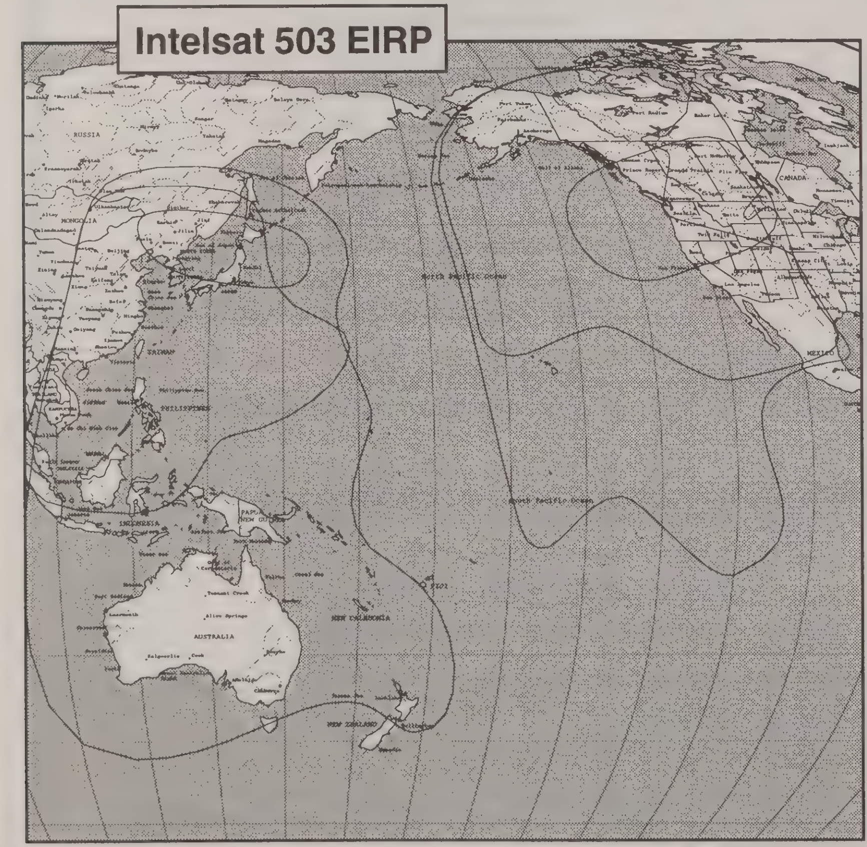
*Member since March 6, 1996
**Member since May 1996

INTELSAT 5 SYSTEM At A Glance

Satellite name:	Intelsat 501/505, 72°E; Intelsat 503, 157°E; Intelsat 506, 328.6°E (31.4°W) [All are in inclined orbits]
Spacecraft data:	
Mass (in orbit):	1,020-1,090 kg
Stabilization:	3-axis
Primary power (EOL):	1,300 W
Launch date:	May 23, 1981 (501); December 15, 1981 (503); September 1982 (505); May 19, 1983 (506)
Launch vehicle:	Atlas/Centaur
Expected lifetime:	7 years (exceeded)
Transponders:	
Number:	5 C-band @ 36 MHz; 16 C-band @ 72 MHz; 4 Ku-band @ 72 MHz; 2 Ku-band @ 241 MHz
Power output:	8.5 and 4.5 W (C-band global and hemispheric), 4.5 W TWTA (C-band zonal); 10 W TWTA (Ku-band spot)
Polarization:	Circular (C-band), Linear (Ku-band)
Uplink frequency:	5.929-6.425 GHz (C-band), 14.004-14.498 GHz (Ku-band)
Downlink frequency:	3.704-4.198 GHz (C-band), 10.954-11.698 GHz (Ku-band)
Single carrier saturation flux density:	-67.5 to -85.1 dBW/sq.m. (C-band global); -64.5 to -82.1 dBW/sq.m. (C-band hemispheric and zonal); -72.0 to -77.0 dBW/sq.m. (Ku-band east spot); -75.3 to -80.3 dBW/sq.m. (Ku-band west spot)
Manufacturer:	Space Systems/Loral (Ford Aerospace at time of manufacture)

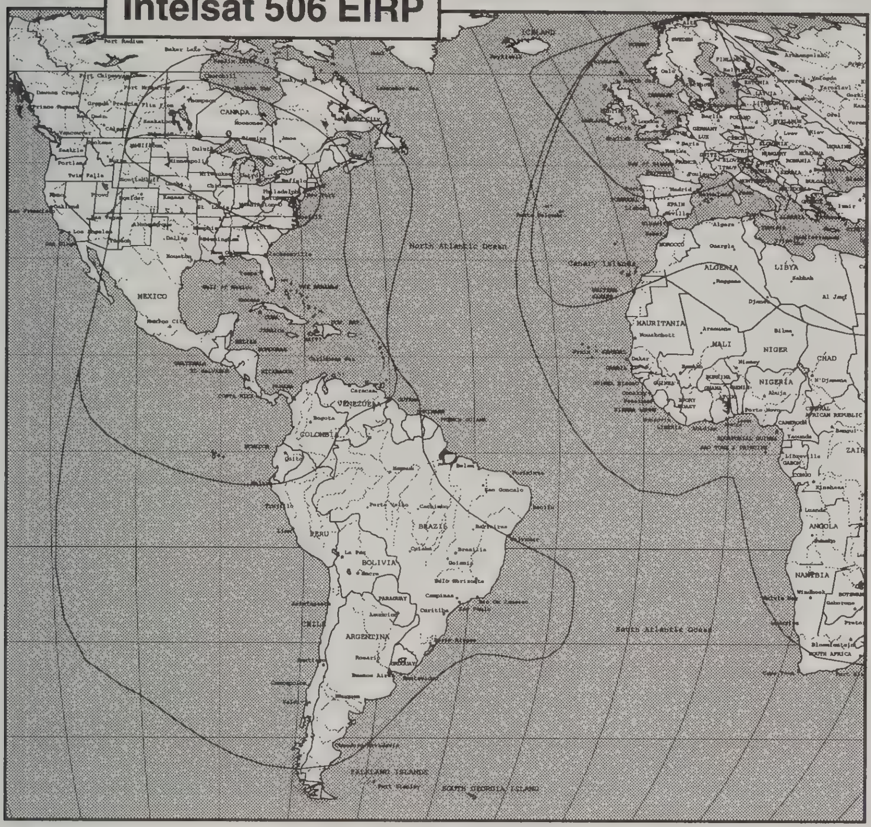


Intelsat 501/505 EIRP



Intelsat 503 EIRP

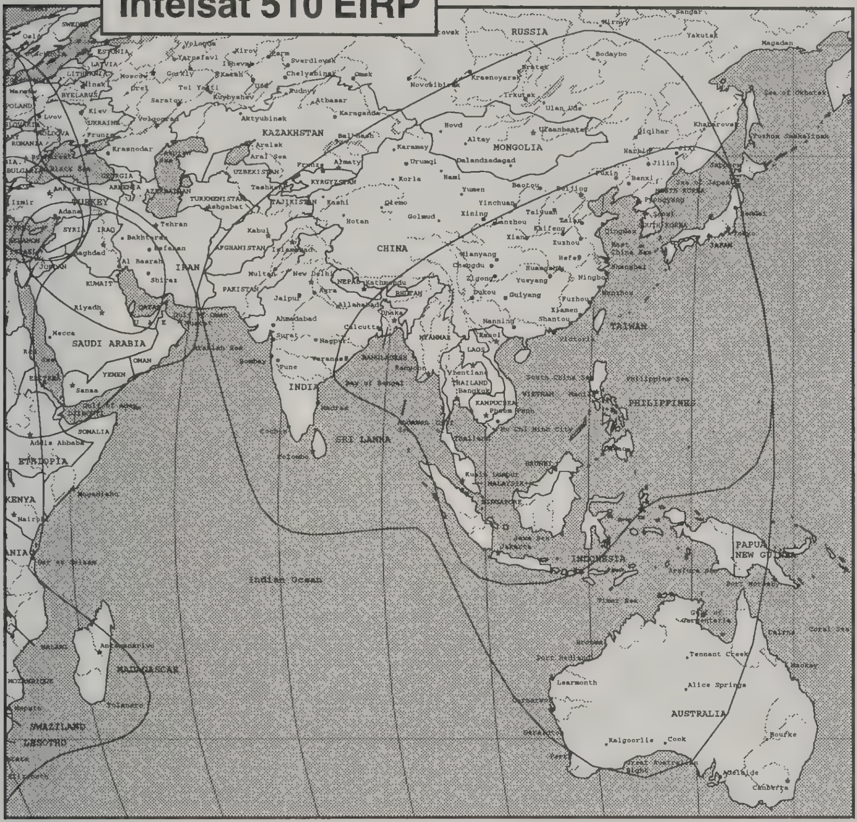
Intelsat 506 EIRP



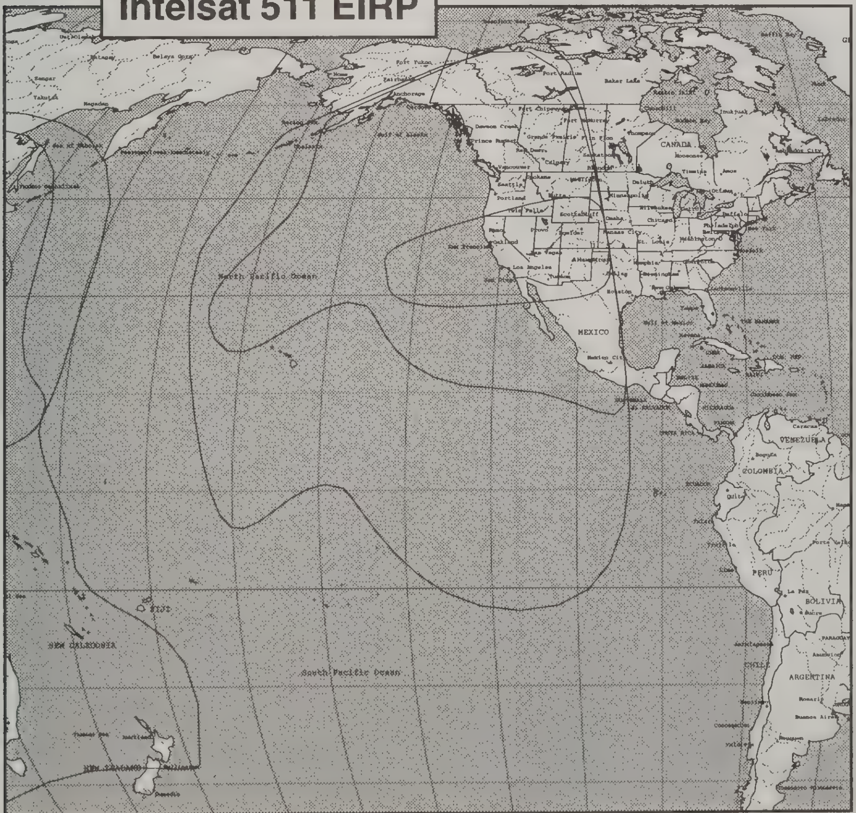
INTELSAT 5A SYSTEM At A Glance

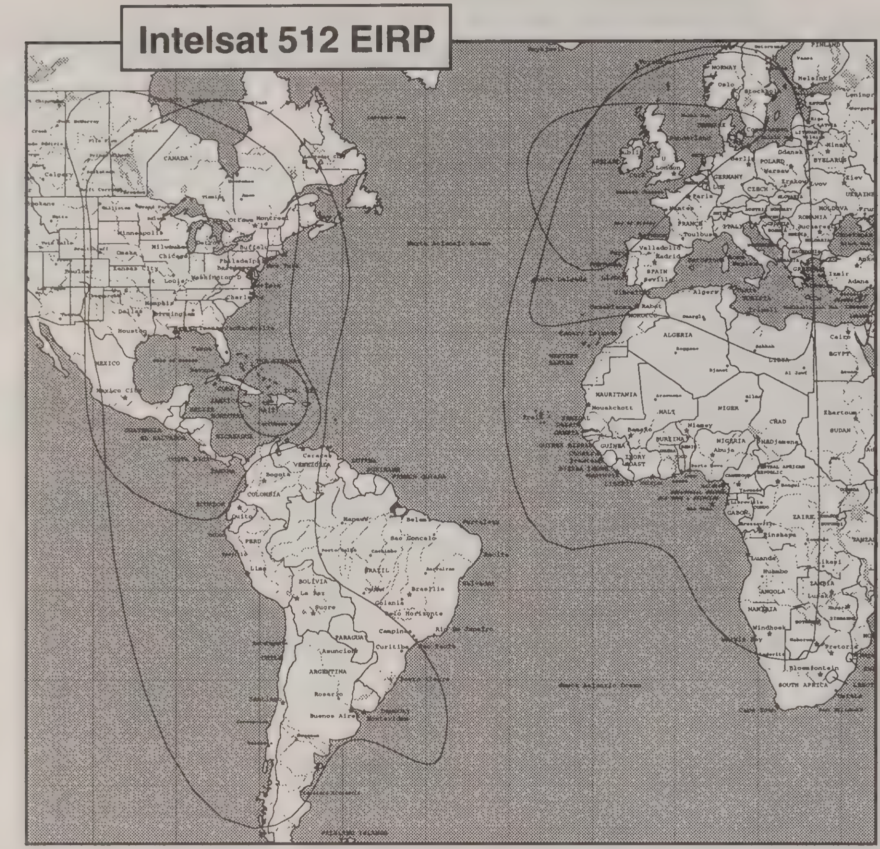
Satellite name:	Intelsat 510, 33°E; Intelsat 511, 180°E; Intelsat 512, 304.5°E (55.5°W); Intelsat 513, 183°E (177°W); Intelsat 515, 338.7°E (21.3°W)
Spacecraft data:	
Mass (in orbit):	1,160 kg
Stabilization:	3-axis
Primary power (EOL):	1,300 W
Launch date:	March 22, 1985 (510); June 29, 1985 (511); September 28, 1985 (512); May 17, 1988 (513); January 26, 1989 (515)
Launch vehicle:	Atlas/Centaur (510-512); Ariane (513-515)
Expected lifetime:	7 years
Transponders:	
Number:	16 C-band @ 36 MHz; 4 Ku-band @ 72 MHz; 2 Ku-band @ 241 MHz; 10 C-band @ 72 MHz
Power output:	8.5 and 4.5 W TWTA (C-band spot, hemispheral and global); 4.5 W TWTA (C-band zonal); 10 W TWTA (Ku-band)
Polarization:	Circular (C-band), Linear (Ku-band)
Uplink frequency:	5.929-6.423 GHz (C-band), 14.004-14.498 GHz (Ku-band)
Downlink frequency:	3.704-4.198 GHz (C-band), 10.954-11.698 GHz (Ku-band)
Single carrier saturation flux density:	-70.1 to -85.1 dBW/sq.m. (C-band global and spot); -67.1 to -84.1 dBW/sq.m. (C-band hemispheric and zonal); -72 to -84 dBW/sq.m. (Ku-band spot)
Manufacturer:	Space Systems/Loral (Ford Aerospace at time of manufacture)

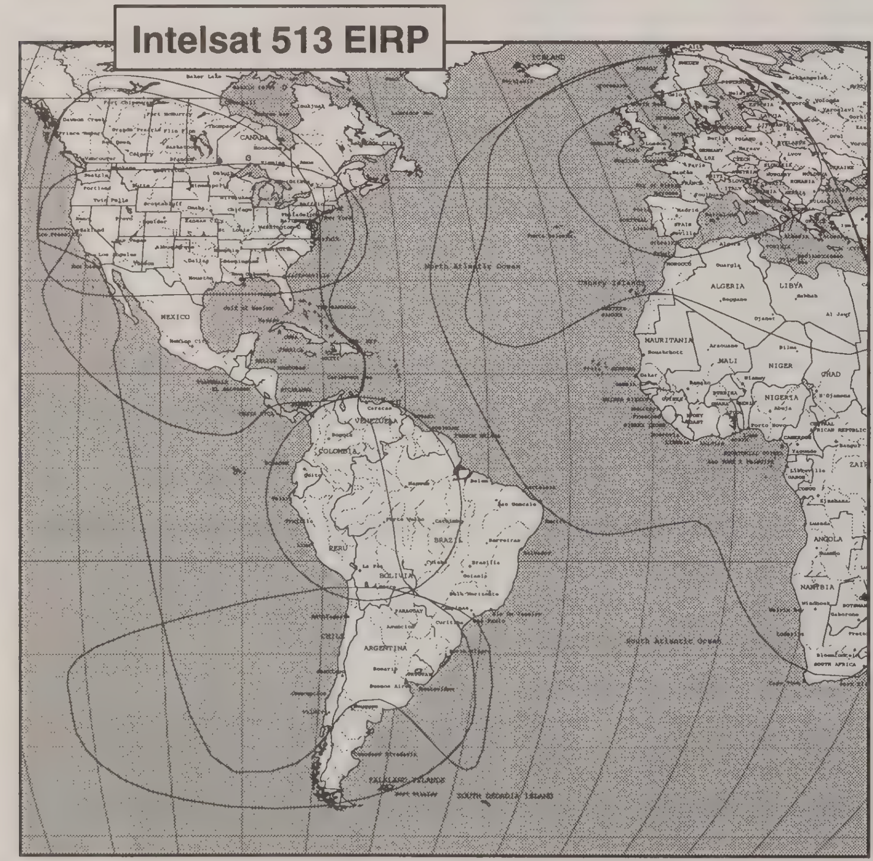
Intelsat 510 EIRP

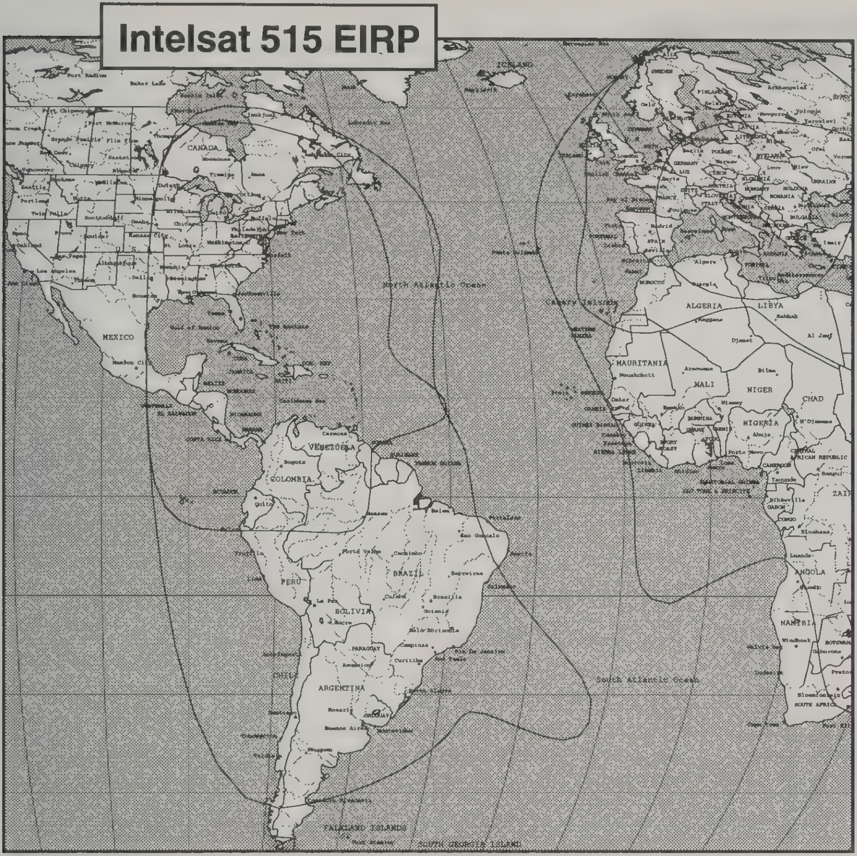


Intelsat 511 EIRP




Intelsat 512 EIRP


Intelsat 513 EIRP

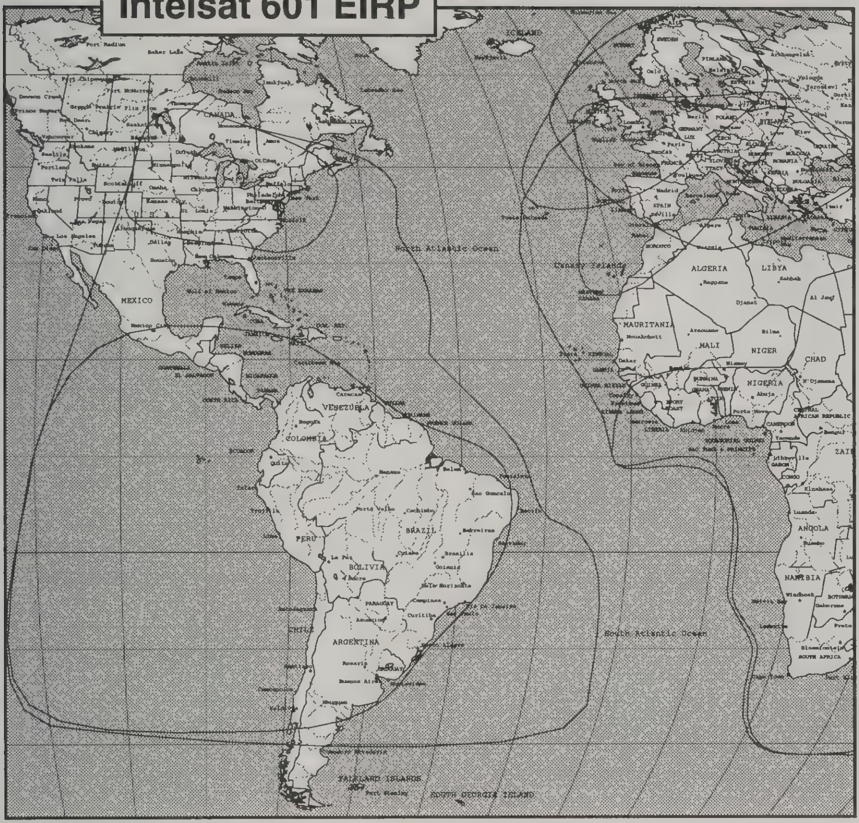


Intelsat 515 EIRP

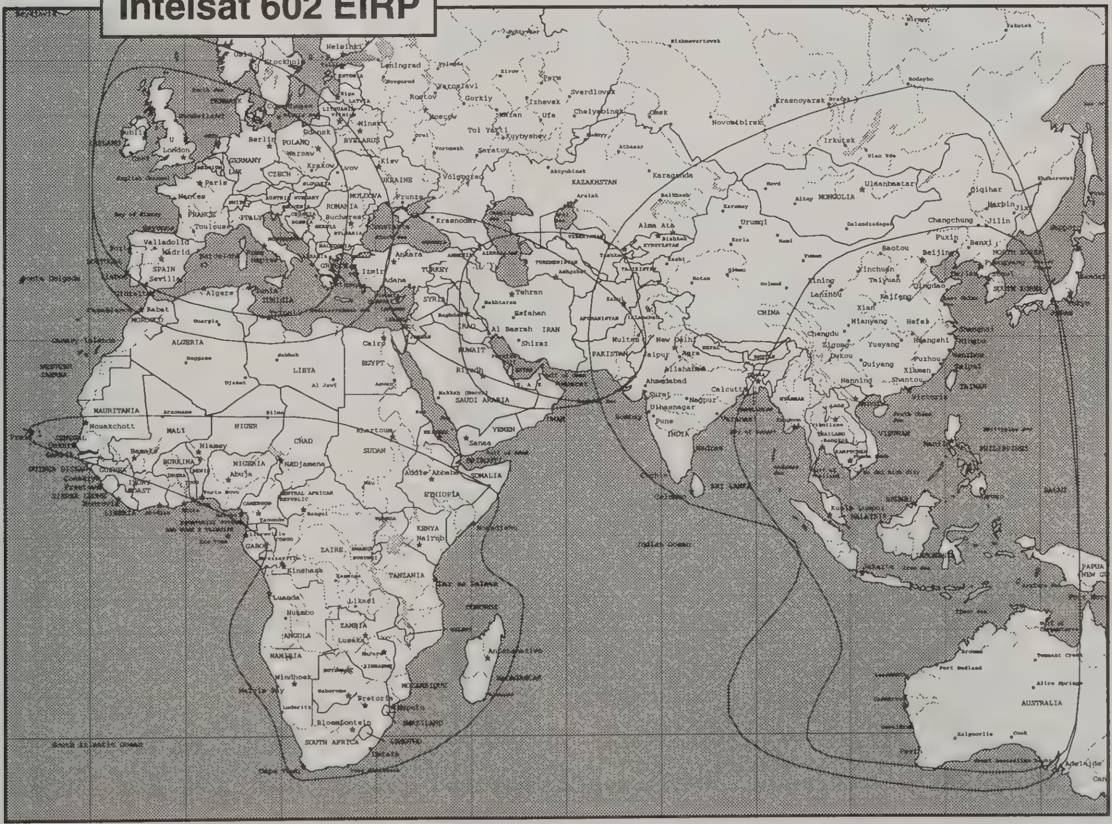
INTELSAT 6 SYSTEM At A Glance

Satellite name:	Intelsat 601, 332.5°E (27.5°W); Intelsat 602, 63°E; Intelsat 603, 325.5°E (34.5°W); Intelsat 604, 60°E; Intelsat 605, 335.5°E (24.5°W)
Spacecraft data:	
Mass (in orbit):	1,160 kg
Stabilization:	Spin
Primary power (EOL):	2,252 W
Launch date:	October 29, 1991 (601); October 27, 1989 (602); March 14, 1990 (603); June 23, 1990 (604); August 14, 1991 (605)
Launch vehicle:	Ariane (601, 602, 605); Titan III (603-604)
Expected lifetime:	10 years
Transponders:	
Number:	26 C-band @ 72 MHz; 12 C-band @ 36 MHz; 2 C-band @ 41 MHz; 6 Ku-band @ 72 MHz; 2 Ku-band @ 77 MHz; 2 Ku-band @ 150 MHz
Power output:	10 and 13.5 W TWTA (C-band global); 16 and 10 W TWTA (C-band hemispheric); 1.8, 3.2, 5.5 and 10 W TWTA (C-band zonal); 20 and 40 W TWTA (Ku-band spot)
Polarization:	Circular (C-band), Linear (Ku-band)
Uplink frequency:	5.850-6.425 GHz (C-band), 14.004-14.498 GHz (Ku-band)
Downlink frequency:	3.625-4.198 GHz (C-band), 10.954-11.698 GHz (Ku-band)
Single carrier saturation flux density:	-70.1 to -82.1 dBW/sq.m. (C-band global); -67.1 to -77.6 dBW/sq.m. (C-band hemispheric and zonal); -72.2 to -84 dBW/sq.m. (Ku-band spot)
G/T:	-14 dB/K (C-band global); -9.5/-9.2 dB/K (C-band hemispheric); -3/-2 dB/K (C-band zonal, NW & NE); -7.5/-7 dB/K (SW & SE)
Manufacturer:	Hughes Aircraft Company

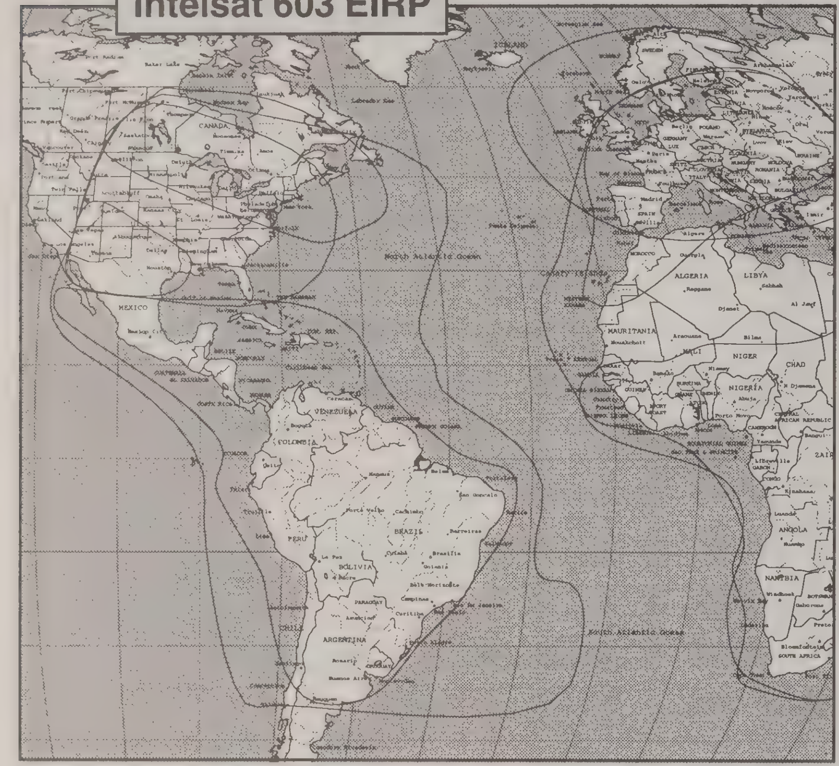
Intelsat 601 EIRP



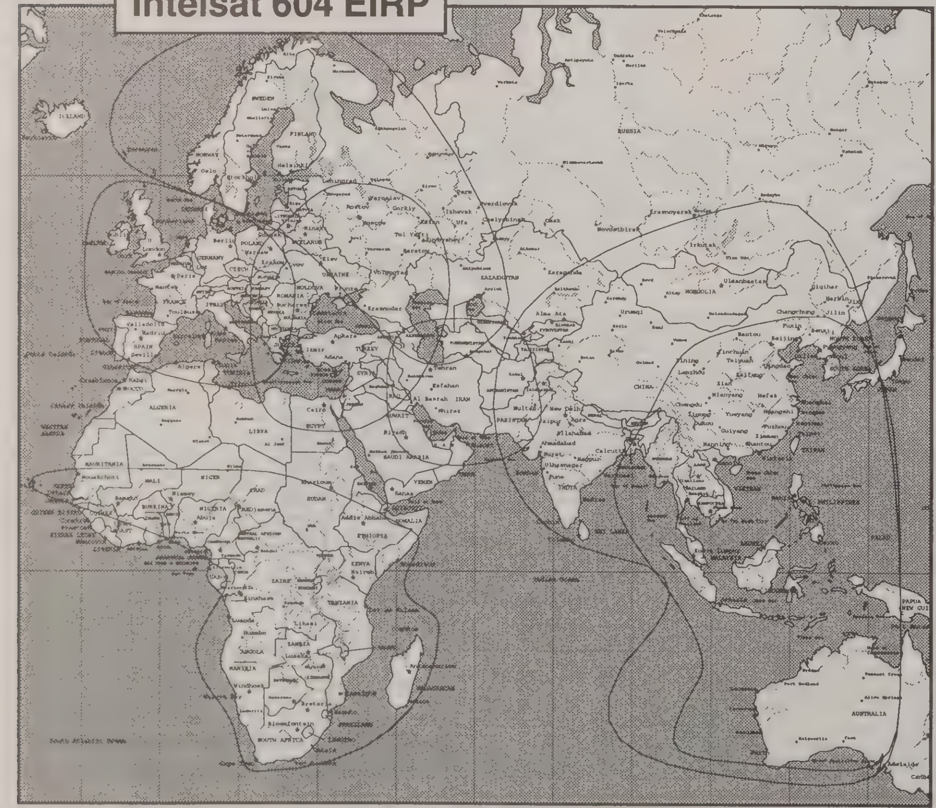
Intelsat 602 EIRP

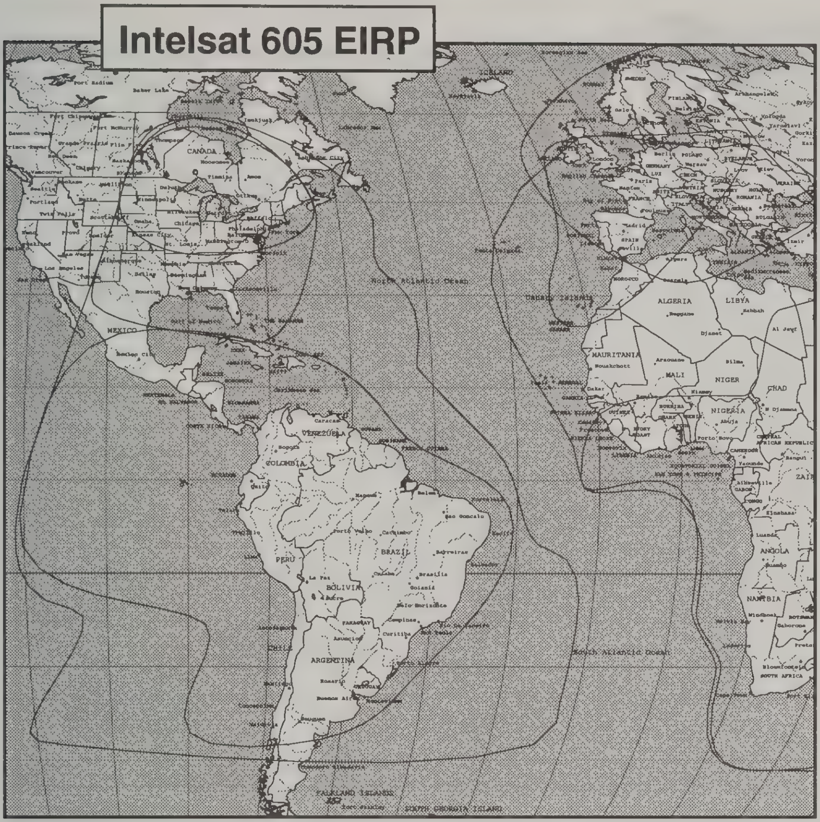


Intelsat 603 EIRP



Intelsat 604 EIRP



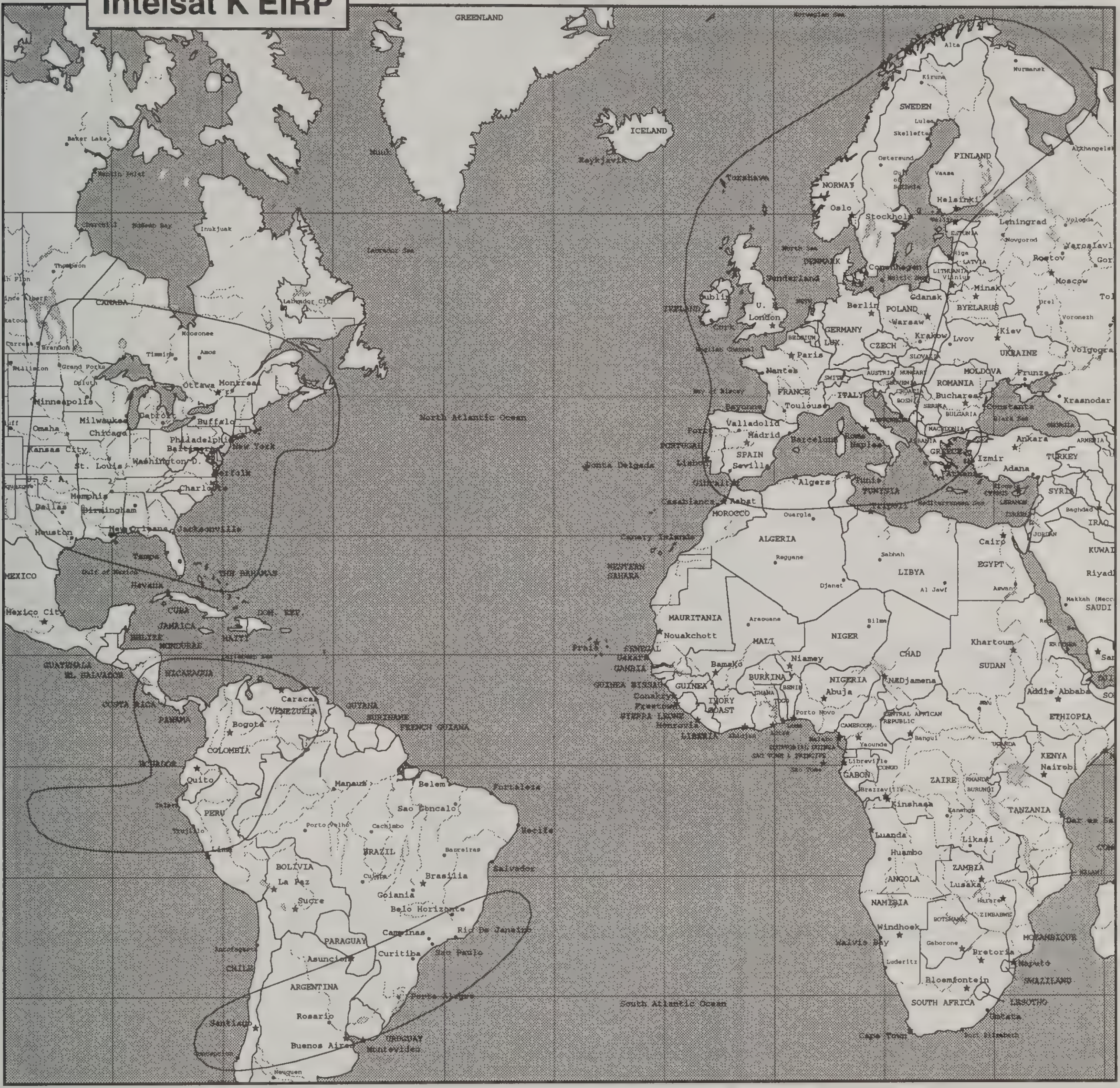


Intelsat 605 EIRP

INTELSAT K SYSTEM At A Glance

Satellite name:	Intelsat K, 338.5°E (21.5°W)
Spacecraft data	
Mass (at launch):	1,473 kg
Stabilization:	Body-stabilized
Primary power (EOL):	3,155 W
Launch date:	June 9, 1992
Launch vehicle:	Atlas IIA
Expected lifetime:	10 years
Transponders:	
Number:	16 @ 54 MHz
Power output:	60 W TWTA
Polarization:	Linear
Uplink frequency:	11.45-11.70 GHz; 11.70-11.95 GHz (North and South America); 12.5-12.75 GHz (Europe only)
Downlink frequency:	14.0-14.5 GHz
Redundancy:	
Transponders:	2:1
TWTA:	11:8
Manufacturer:	Martin Marietta Astrospace (GE Astro Space at time of manufacture)

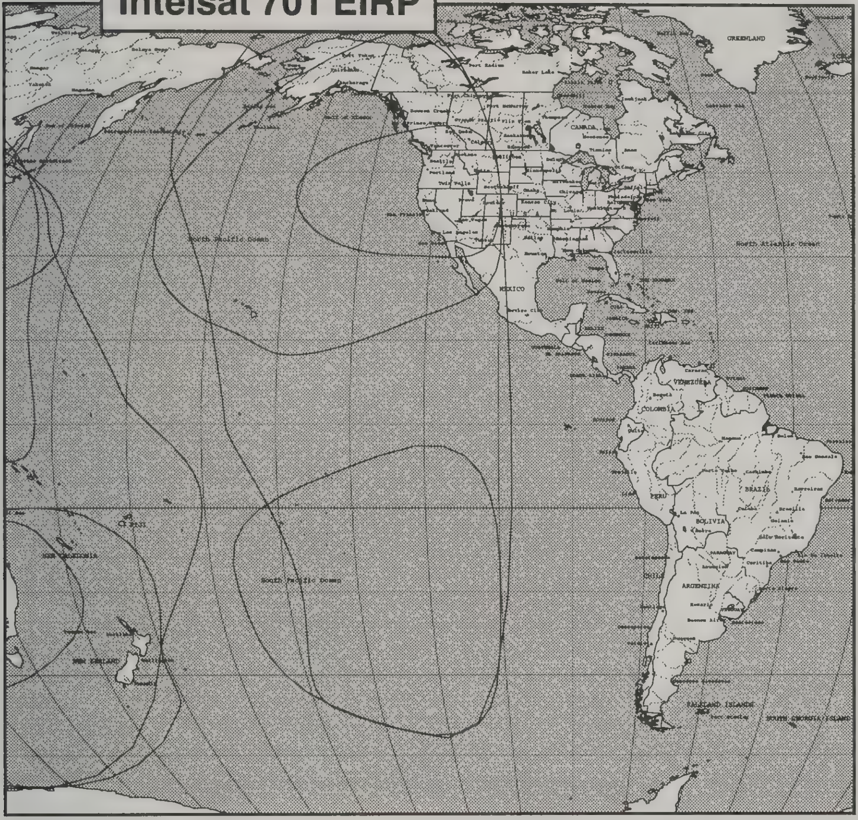
Intelsat K EIRP



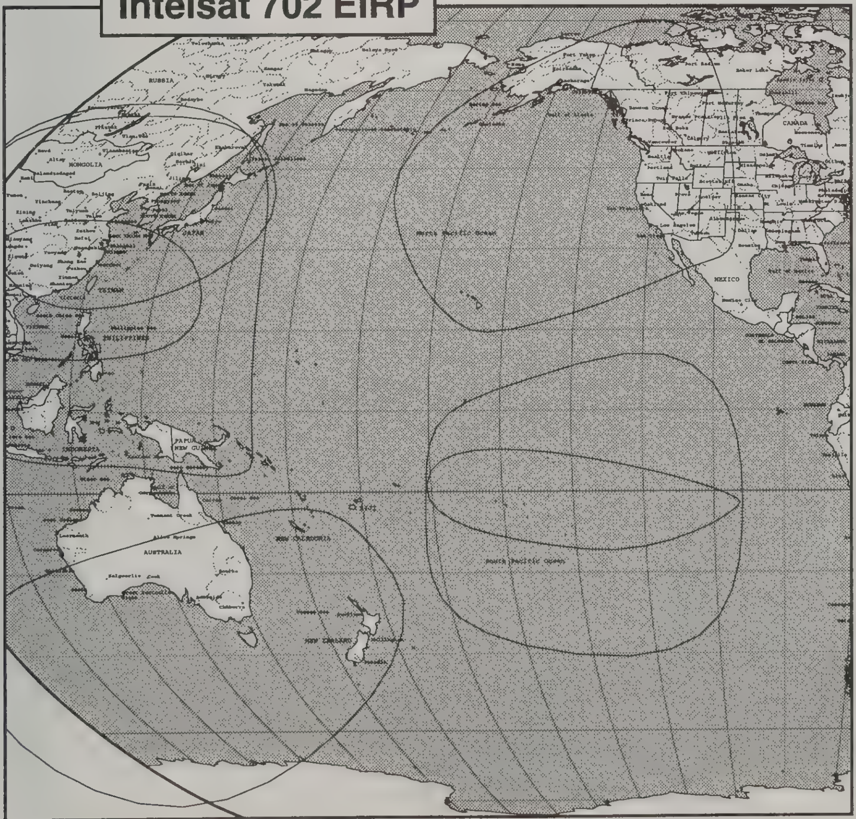
INTELSAT 7 SYSTEM At A Glance

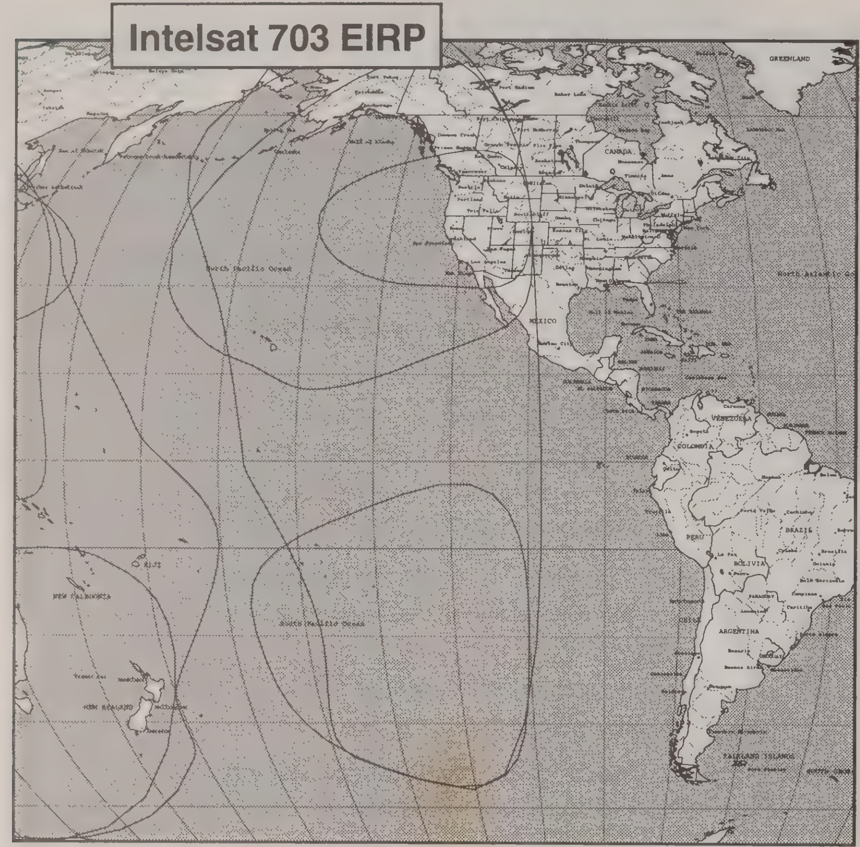
Satellite name:	Intelsat 701, 174°E; Intelsat 702, 177°E; Intelsat 703, 57°E; Intelsat 704, 66°E; Intelsat 705, 342°E (18°W)
Spacecraft data:	
Mass (at launch):	1,470 kg
Launch date:	October 22, 1993 (701); June 17, 1994 (702); October 6, 1994 (703); January 10, 1995 (704); March 22, 1995 (705)
Launch vehicle:	Ariane (701, 702), Atlas IIAS (703-705)
Expected lifetime:	10 years
Transponders:	
Number:	26 C-band @ 34, 36, 41, 72 and 77 MHz; 10 Ku-band @ 34, 72, 77 and 112 MHz
Power output:	10, 16, 20 and 30 W SSPA (C-band), 35 and 50 W TWTA (Ku-band)
Single carrier saturation flux density:	-87 to -73 dBW/sq.m.
G/T:	-12 dB/K (C-band global); -5 dB/K (C-band spot); -8.7/-8.5 to -7.5 dB/K (C-band hemispheric); -9.2 to -4 dB/K (C-band zonal)
Manufacturer:	Space Systems/Loral

Intelsat 701 EIRP

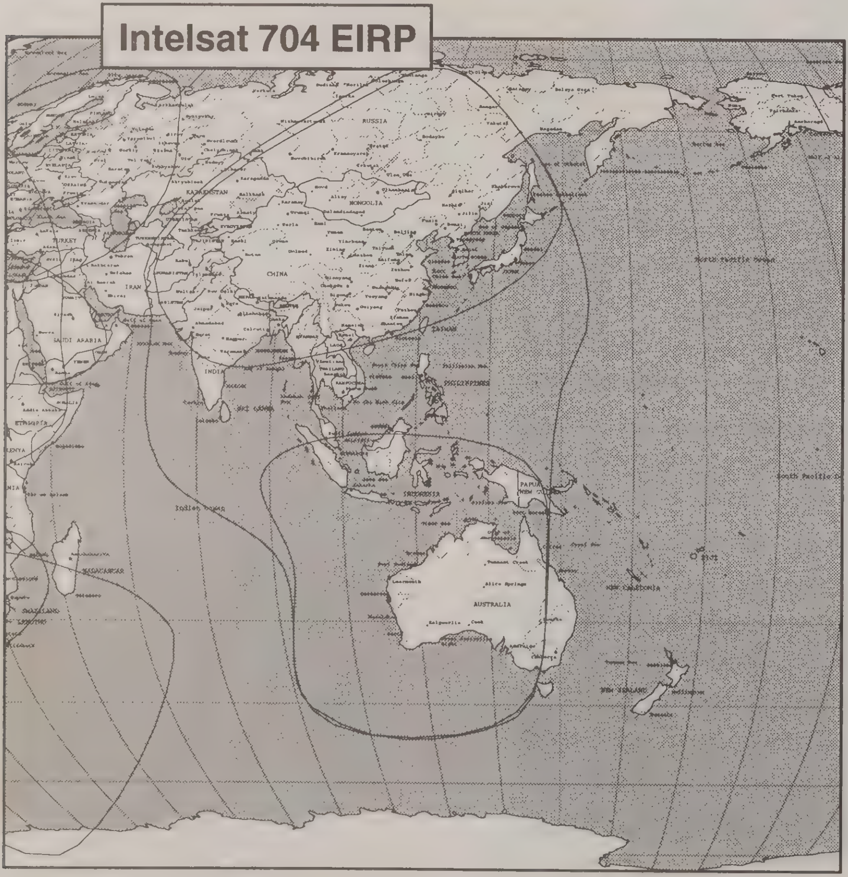


Intelsat 702 EIRP



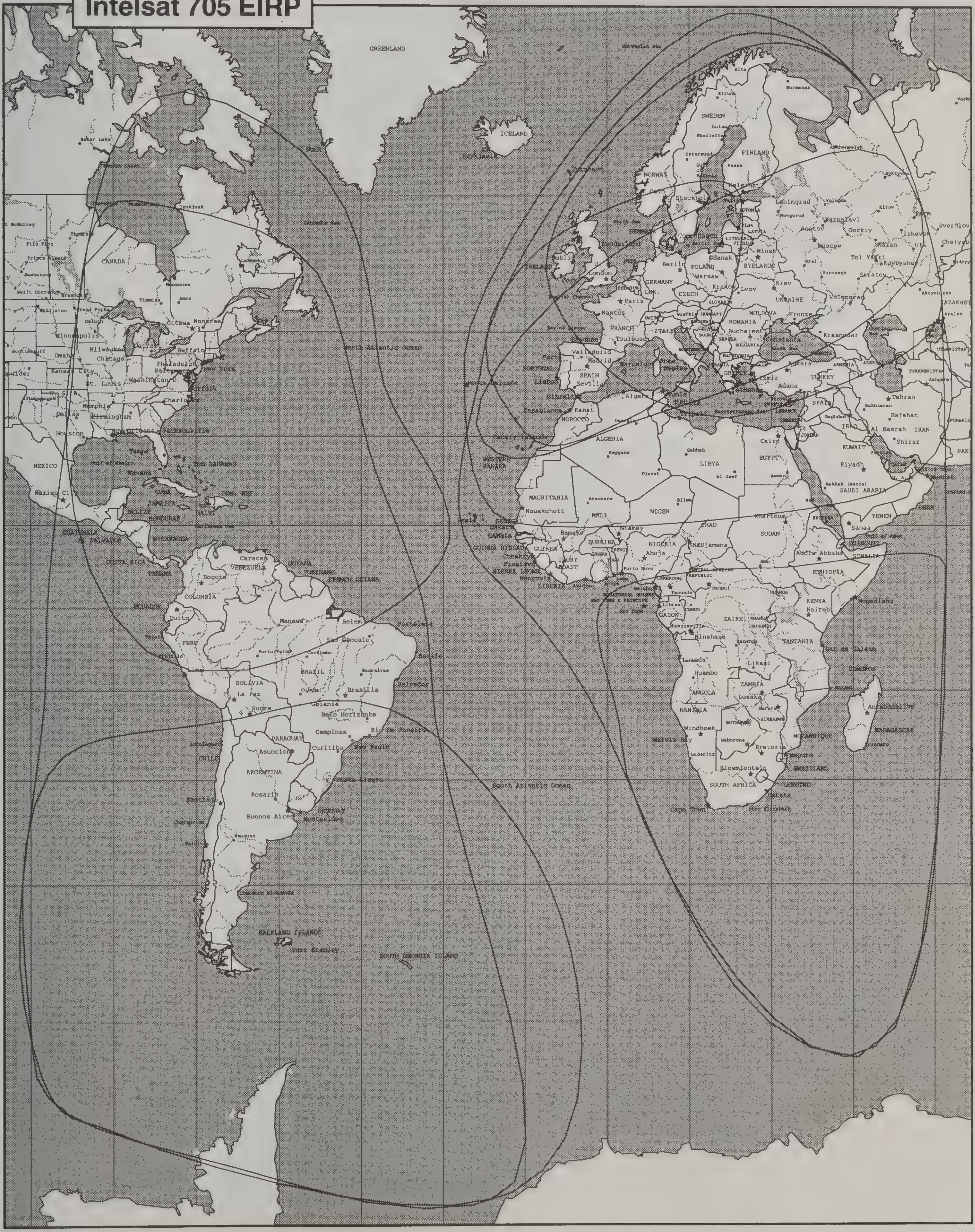


Intelsat 703 EIRP



Intelsat 704 EIRP

Intelsat 705 EIRP

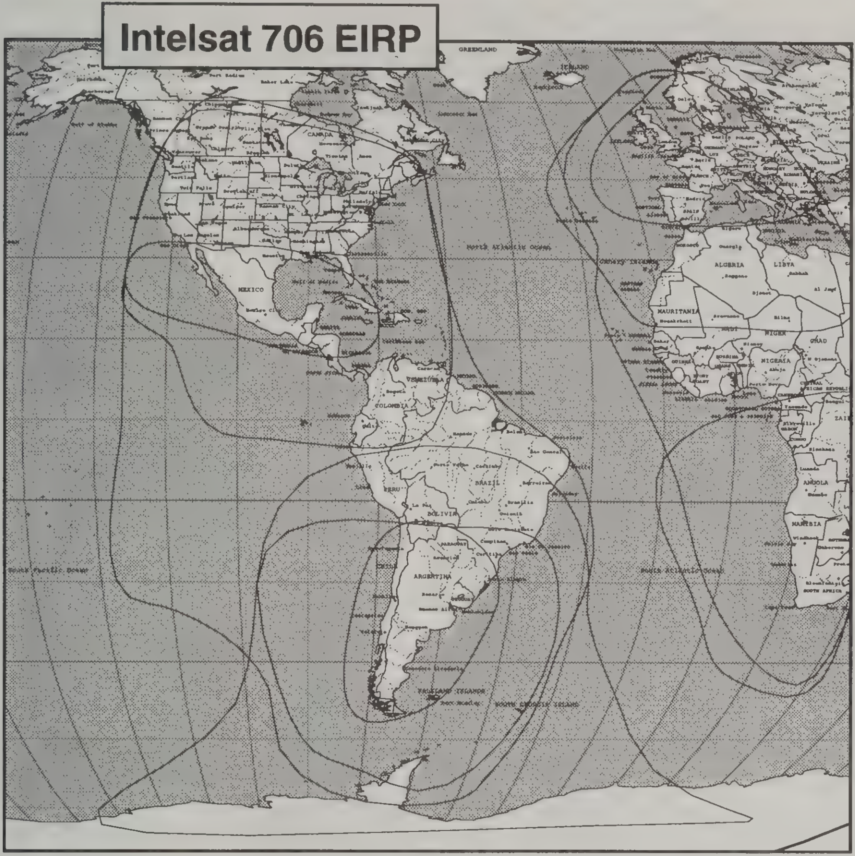


INTELSAT 7A SYSTEM At A Glance

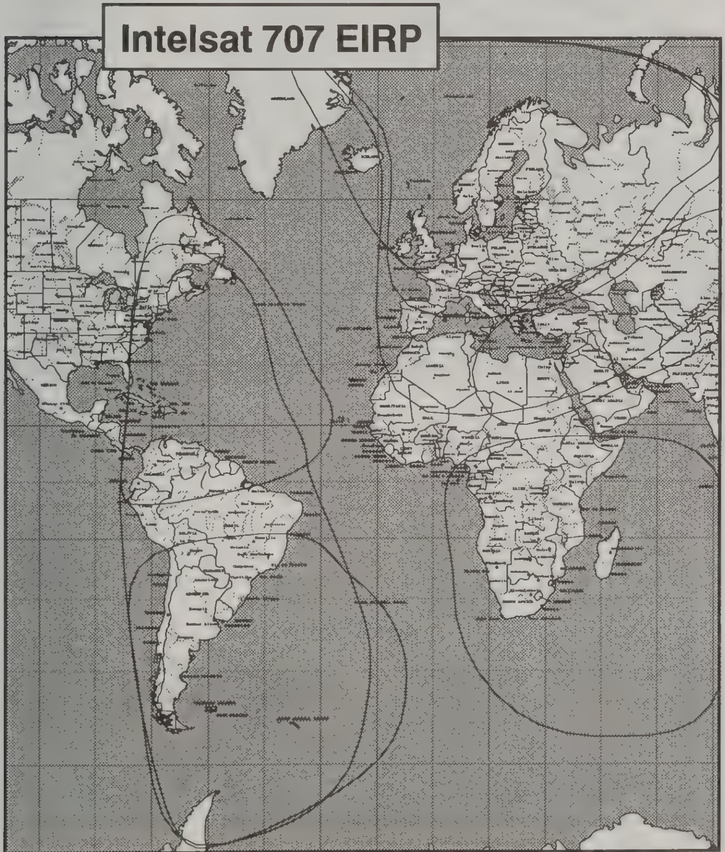
Satellite name:	Intelsat 706, 307°E (53°W); Intelsat 707, 359°E (1°W); Intelsat 708[+], 310°E (50°W); Intelsat 709, 310°E (50°W)
Spacecraft data:	
Mass (at launch):	1,823 kg
Launch date:	May 17, 1995 (706); March 14, 1996 (707); June 15, 1996 (709)
Launch vehicle:	Ariane (706); Ariane 44P (707, 709)
Expected lifetime:	10.9 years
Transponders:	
Number:	26 C-band @ 34, 36, 41, 72 and 77 MHz; 14 Ku-band @ 34, 72, 77 and 112 MHz
Single carrier saturation flux density:	-87 to -73 dBW/sq.m.
G/T:	-12 dB/K (C-band global); -5 dB/K (C-band spot); -8.7 to -7.5 dB/K (C-band hemispheric); -9.2 to -4.1 dB/K (C-band zonal)
Manufacturer:	Space Systems/Loral

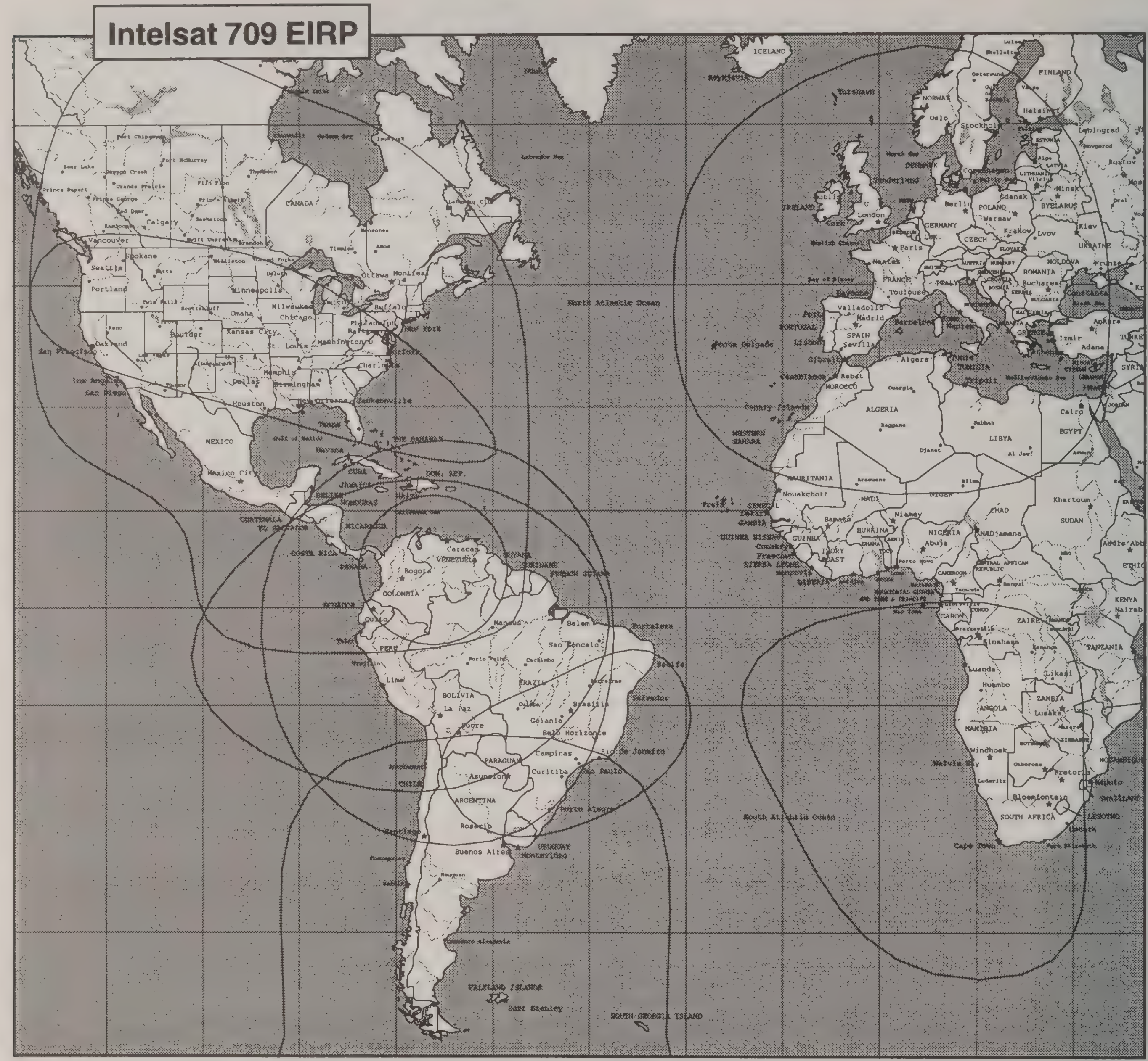
[+] The Long March 3B rocket exploded with its payload on February 14, 1996.

Intelsat 706 EIRP



Intelsat 707 EIRP





Intelsat 709 EIRP

INTELSAT 8 SYSTEM At A Glance

Satellite name: 801, 174°E; 802*, 177°E (to be launched);
803*, 64°E (to be launched);
804, 338.5°E (21.5°W) [to be launched]

Spacecraft data:

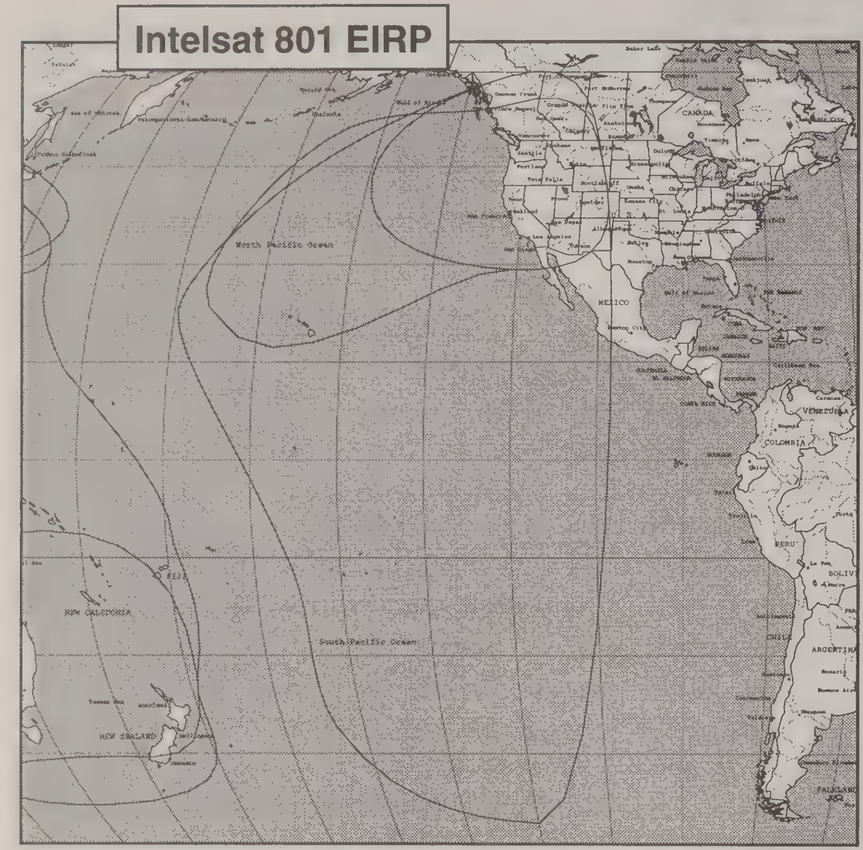
- Mass (at launch): 1,530 kg
- Launch date: February 28, 1997 (801), May 1997 (802),
  August 1997 (803), November 1997 (804)
- Launch vehicle: Ariane 44P
- Expected lifetime: 14-18 years

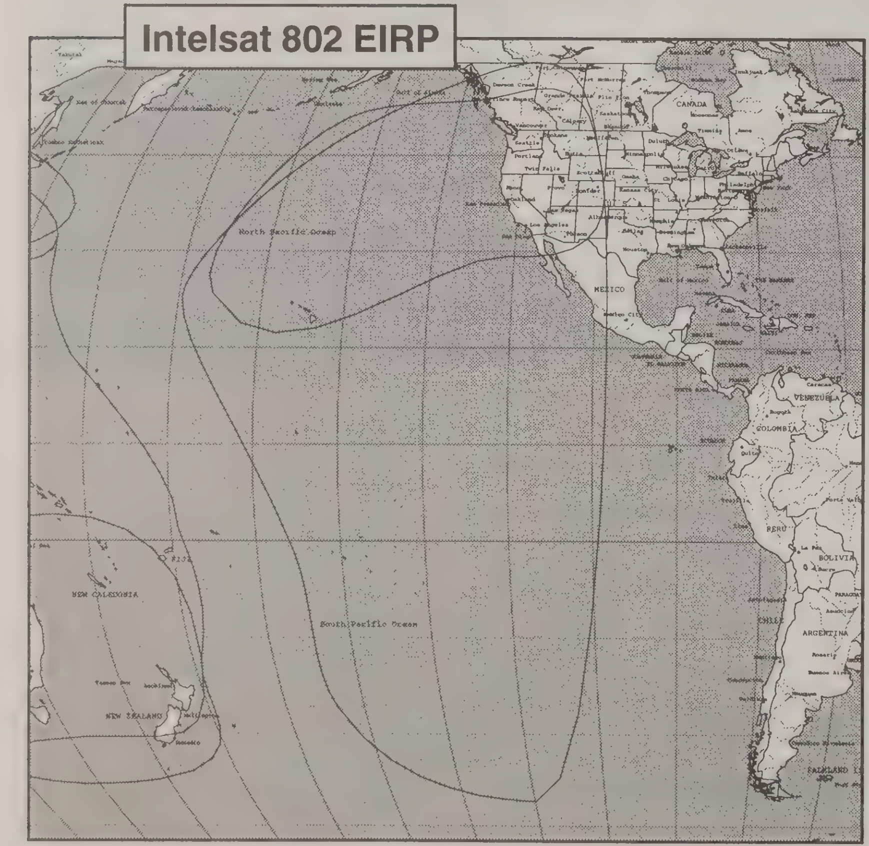
- Transponders:
  - Number: 38 C-band, 6 Ku-band
  - EIRP: 29 dBW (C-band global);
    36 dBW (C-band hemispheral and zonal);
    47 dBW (Ku-band spot)

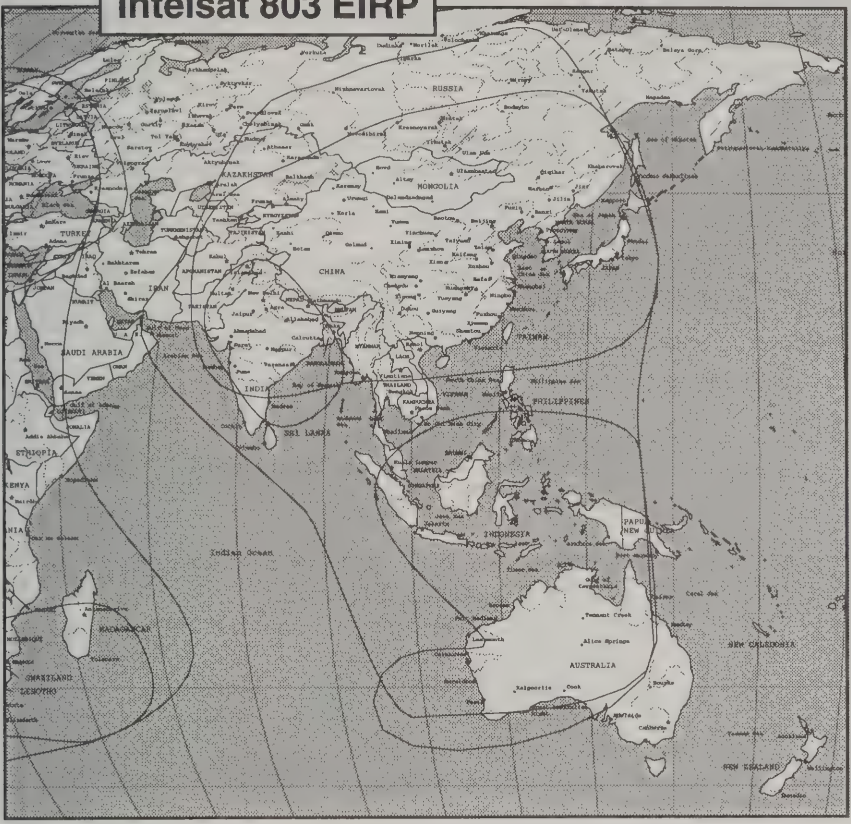
- Single carrier saturation flux density: -89 to -67 dBW/sq.m. (C-band global);
  -90.5 to -68.5 dBW/sq.m.
  (C-band hemispheric and inner zonal);
  -89 to -67 dBW/sq.m.
  (C-band hemispheric and outer zonal)
- G/T: -12 dB/K (C-band global);
  -8 dB/K (C-band hemispheric);
  -2 to -5 dB/K (C-band zonal)

- Manufacturer: Lockheed Martin

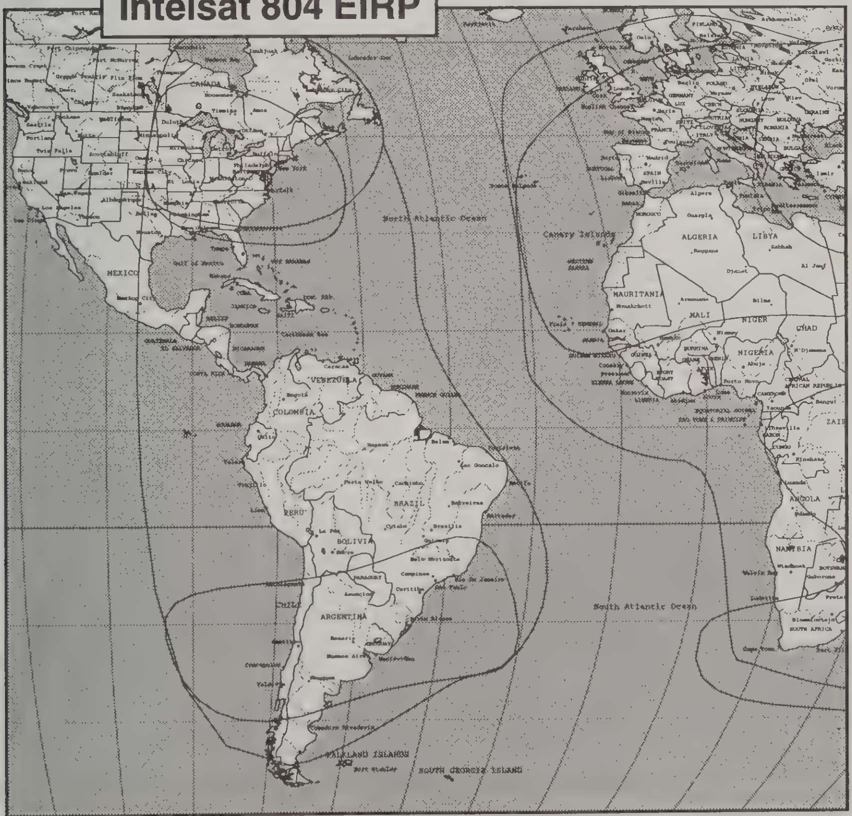
*May be launched on Ariane 44LP with an AMSAT spacecraft if technical compatibiltiy is verified


Intelsat 801 EIRP


Intelsat 802 EIRP



Intelsat 803 EIRP

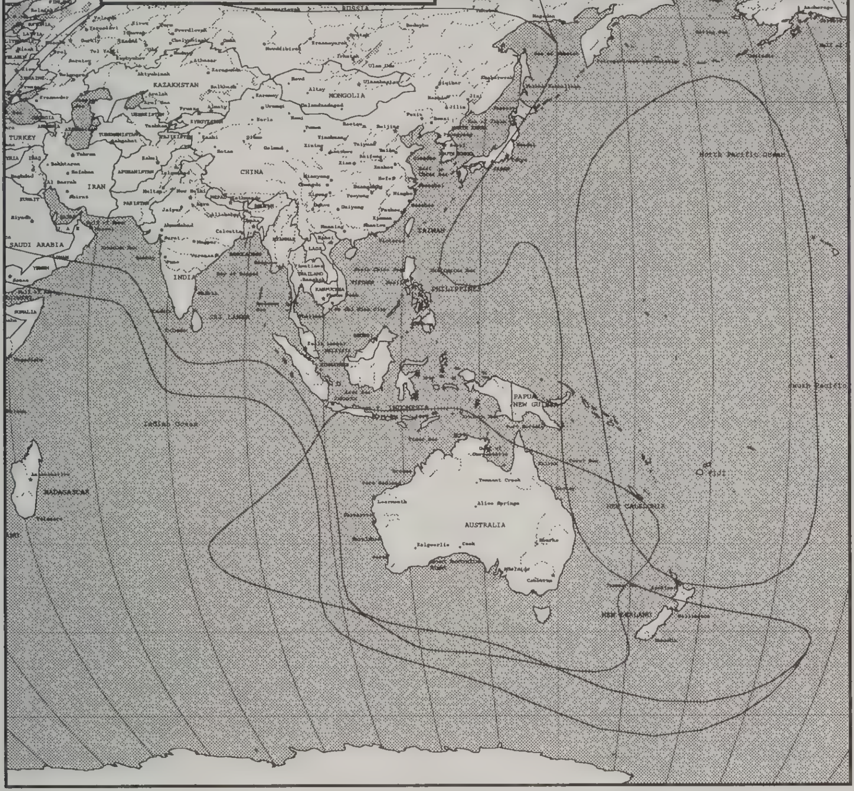


Intelsat 804 EIRP

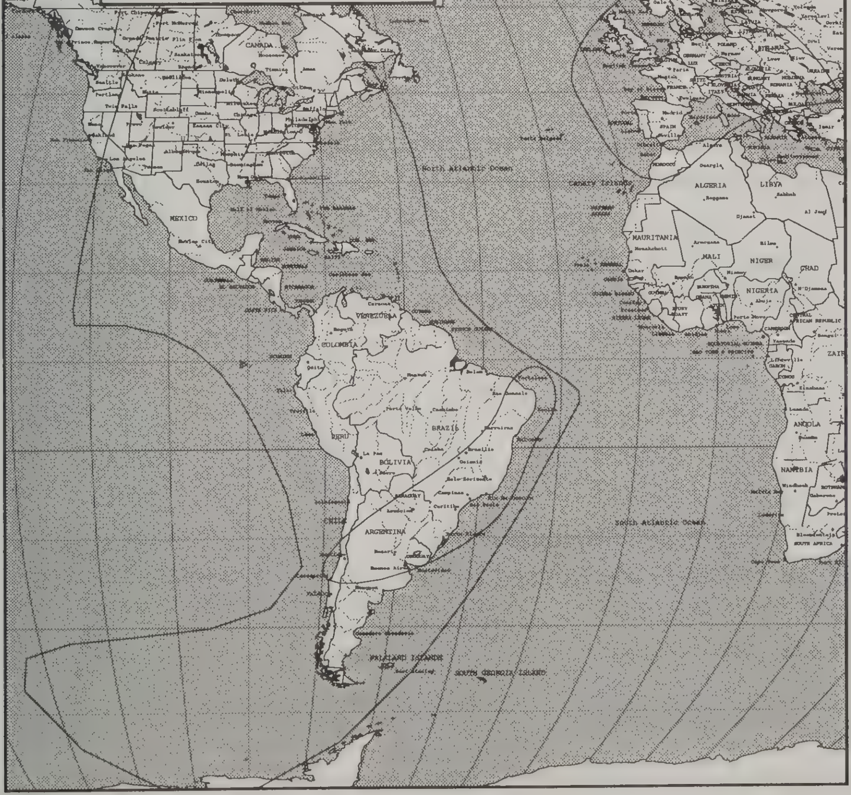
INTELSAT 8A SYSTEM At A Glance

Satellite name:	805, 110.5°E (to be launched); 806, 319.5°E (40.5°W) [to be launched]
Spacecraft data:	
Mass (at launch):	1,530 kg
Launch date:	July 1998 (805), March 1998 (806)
Launch vehicle:	Atlas IIAS
Expected lifetime:	14-18 years
Transponders:	
Number:	38 C-band, 6 Ku-band
EIRP:	29-39 dBW (C-band hemispheral or zonal); 48-51 dBW (Ku-band spot)
Single carrier saturation flux density:	-89 to -67 dBW/sq.m. (C-band global); -90.5 to -68.5 dBW/sq.m. (C-band hemispheric and inner zonal); -89 to -67 dBW/sq.m. (C-band hemispheric and outer zonal)
G/T:	-12 dB/K (C-band global); -8 dB/K (C-band hemispheric); -2 to -5 dB/K (C-band zonal)
Manufacturer:	Lockheed Martin

Intelsat 805 EIRP



Intelsat 806 EIRP



INTERSPUTNIK
(INTERNATIONAL ORGANIZATION OF SPACE COMMUNICATIONS)

2nd Smolensky, 1/4
12 1099 Moscow
RUSSIA

Telephone:	+7 095-244-0333
Facsimile:	+7 095-253-9906
Telex:	411288 DISKSU
Corporate E-mail:	dir@intersputnik.msk.ru

Booking Contact:

Booking office (24 hours): 095-241-7273

Public Relations Contact:

Neil Bakmann, Director of Marketing, 095-244-0698

Overview:

Established in 1971, Intersputnik provides interocean, regional and domestic communications as well as assistance in establishing communications channels and creation of terrestrial technical facilities for operation in the system. Intersputnik took over the Rimsat satellites in September 1995.

Services Offered:

- Telephony, facsimile, telex and data exchange in international, domestic and regional public networks as well as in dedicated networks
- International exchange of TV and audio programs
- Domestic and regional TV and audio broadcasting in VSAT networks
- Domestic and regional TV audio direct broadcasting service via community and individual receive terminals
- Videoconferencing and business networks

Satellite Control:

TT&C station: Dubnan (Atlantic Region) - Statsionar 4
Vladimir (Indian Region) - Statsionar 13

Intersputnik Member Countries And Their Earth Stations

Member Nation	Earth Station	Satellite
Afghanistan	Shamsad	Statsionar 4
Bulgaria	Shipka	Statsionar 4
Cuba	Caribe	Statsionar 4
Czech Republic	Sedlec-1	Statsionar 4
	Sedlec-2	Statsionar 13
Georgia	None	N/A
Germany	New Golin-2	Statsionar 4
	New Golin-1	Statsionar 13
Hungary	Balaton	Statsionar 4
Kazakhstan	None	N/A
Korea	Pyongyang	Statsionar 13
Laos	Dokboua	Statsionar 13
Mongolia	Naran	Statsionar 13
Nicaragua	Diriangen	Statsionar 4
Poland	Psary	Statsionar 4
Romania	None	N/A
Russia	Dubna, Arbat	Statsionar 4
	Vladimir, Novosibirsk	Statsionar 13
Syria	Sednaya	N/A
Vietnam	Hoasen-1 and -2	Statsionar 13
Yemen	Ras-Boradli-3	Statsionar 4

Earth Stations In Non-Member Countries

Nation	Earth Station	Satellite
Cambodia	Bayon	Statsionar 13
Canada	Mill Village, Pennant Point-02A	Statsionar 4
China	Beijing	Statsionar 13
Iraq	Dudjail	Statsionar 4
Japan	Ibaraki-2	Statsionar 13
Madagascar	Antananarivo	Statsionar 4
USA	Roaring Creek, Staten Island Fort Dietrick, Holmdel, Isoz (Atlanta)	Statsionar 4

EXPRESS SYSTEM At A Glance

Satellite name:	Express 2, 346°E (14°W); Express 6, 80°E
Spacecraft data:	
Mass:	2,500 kg
Stabilization:	3-axis
Primary power (EOL):	2,400 W
Eclipse protection:	Yes, for all transponders
Launch date:.	October 1994 (2), September 26, 1996 (6)
Launch vehicle:	Proton
Expected lifetime:	5-7 years
Transponders:	
Numbers:	10 C-band; 2 Ku-band
Power output:	10.5 W C-band; 65 W C-band; 15 W Ku-band
Polarization:	Circular (C-band); Linear (Ku-band)
Redundancy:	100%
Uplink G/T:	-11.0; -4.0 dB/K
Manufacturer:	Inforcosmos-Russia

Express Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
6	RHCP	36	35.6-46.1	6.0000	3.6750
7	RHCP	36	28.9-34.7	6.0500	3.7250
8	RHCP	36	28.9-34.7	6.1000	3.7750
9	RHCP	36	28.9-34.7	6.1500	3.8250
10	RHCP	36	28.9-34.7	6.2000	3.8750
11	RHCP	36	28.9-34.7	6.2500	3.9250
12	LHP	36	39.2	14.325	11.525
14	RHCP	36	34.7-38.2	6.3000	3.9750
15	RHCP	36	28.9-34.7	6.3500	4.0250
16	RHCP	36	34.7-38.2	6.4000	4.0750
17	RHCP	36	28.9-34.7	6.4500	4.1250
20	LHP	36	39.2	14.425	11.625

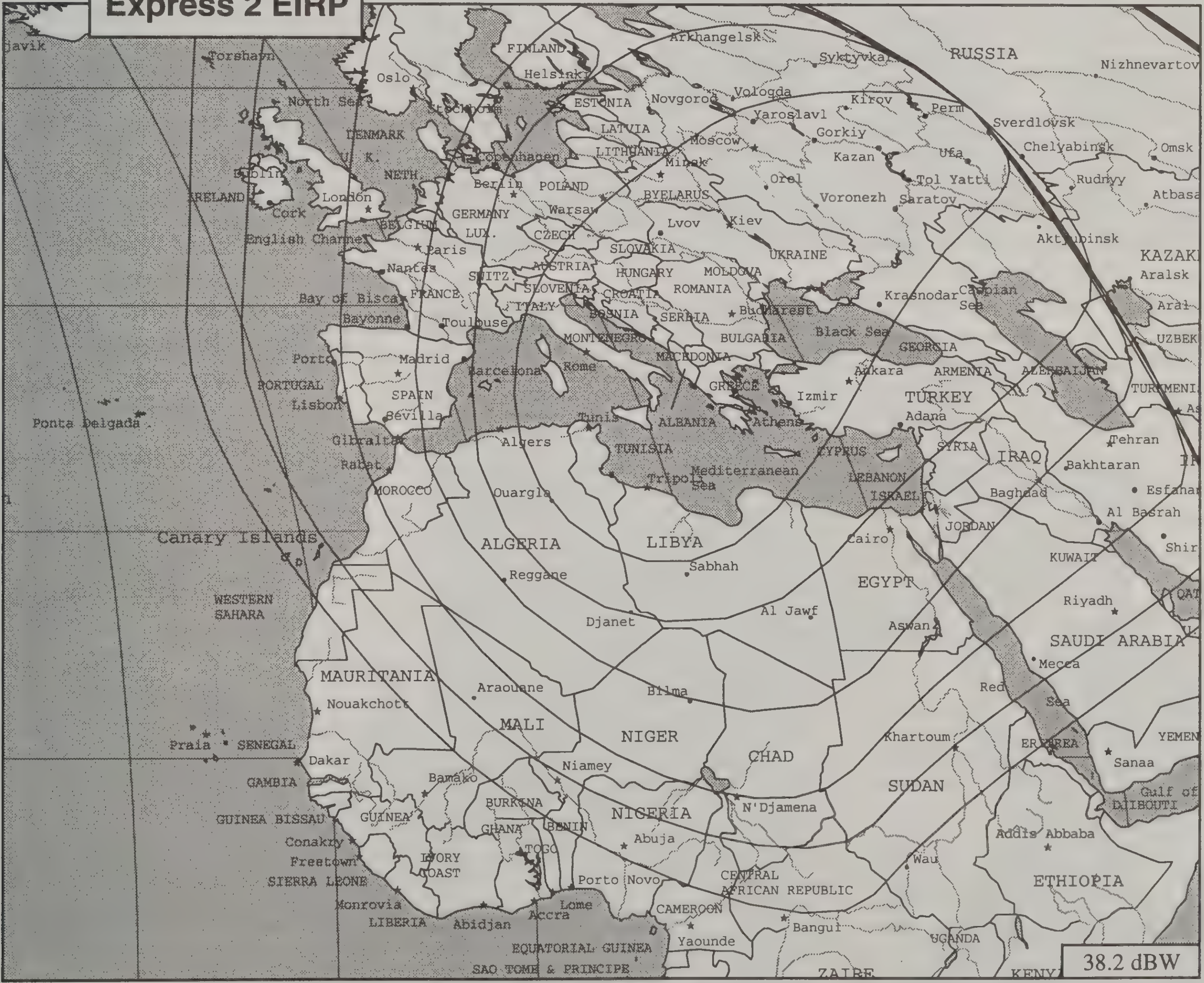
Express

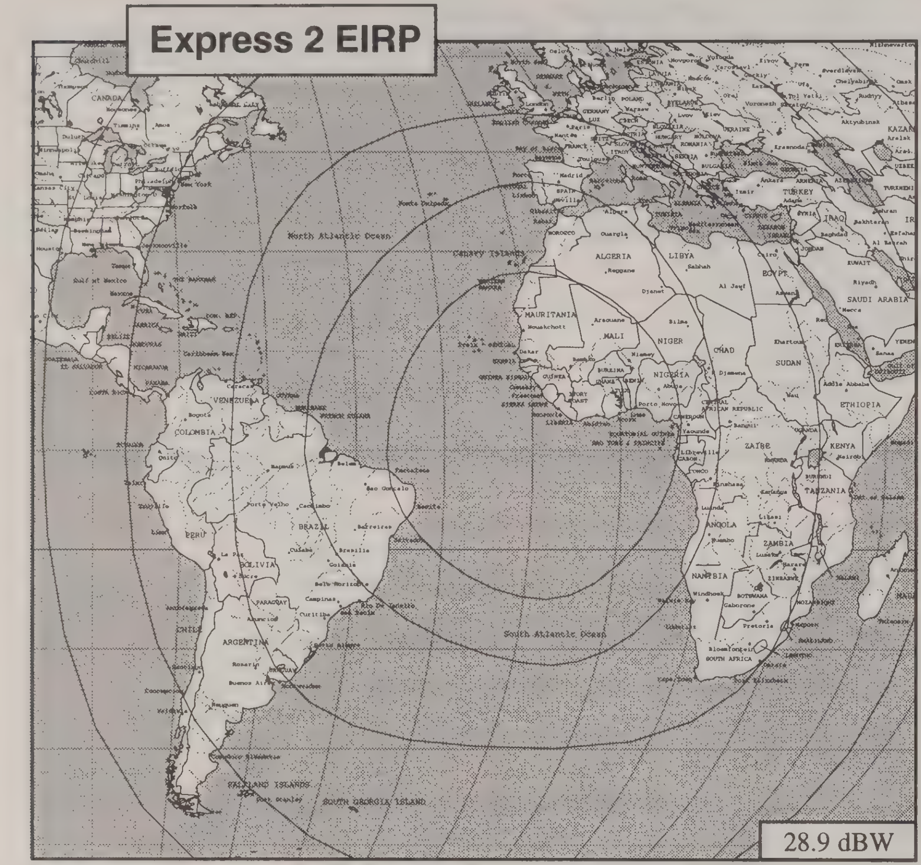
Orbital location:	346ºE (14°W) [2]; 80ºE (6)
Launch:	October 1994 (2); September 1996 (6)
Expected lifetime:	5-7 years
Expected end of life:	2001 (2); 2003 (6)

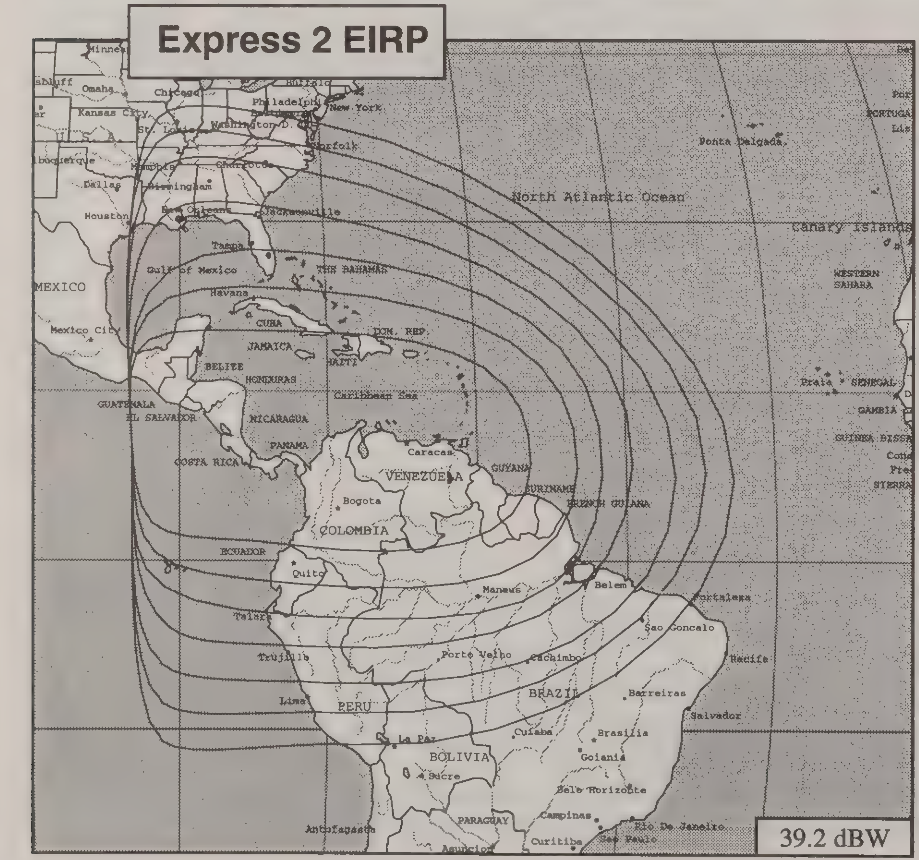
Antennas beam coverage overview:

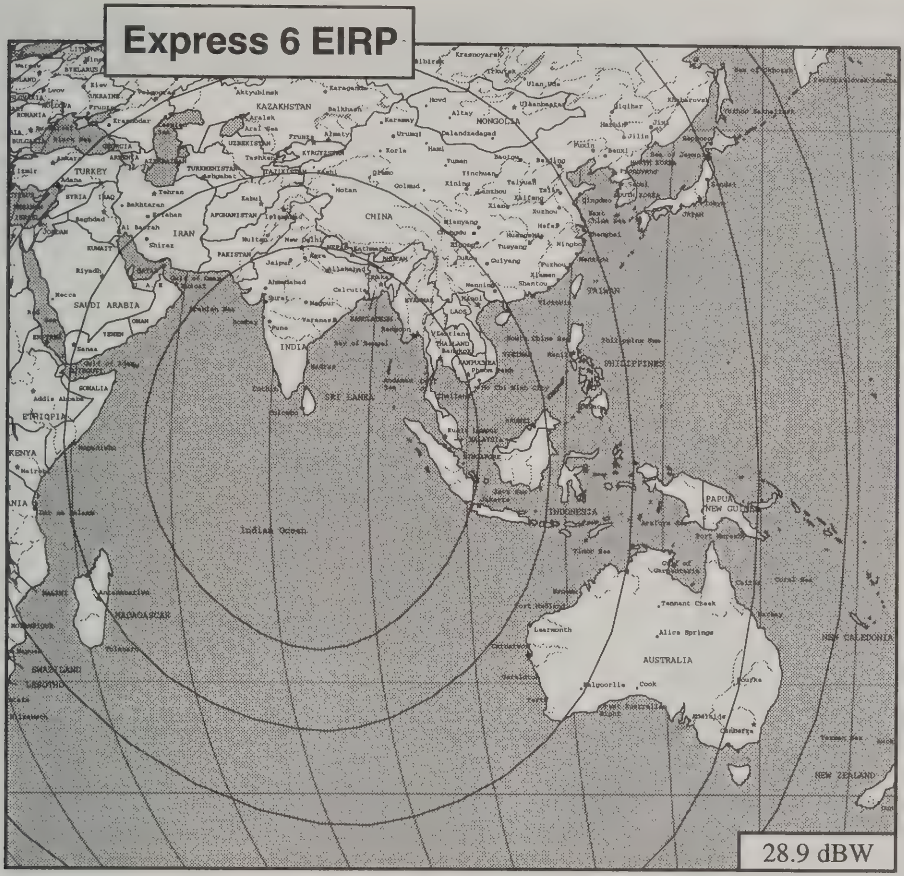
C-band , Ku-band:	Europe, Africa, North and South America

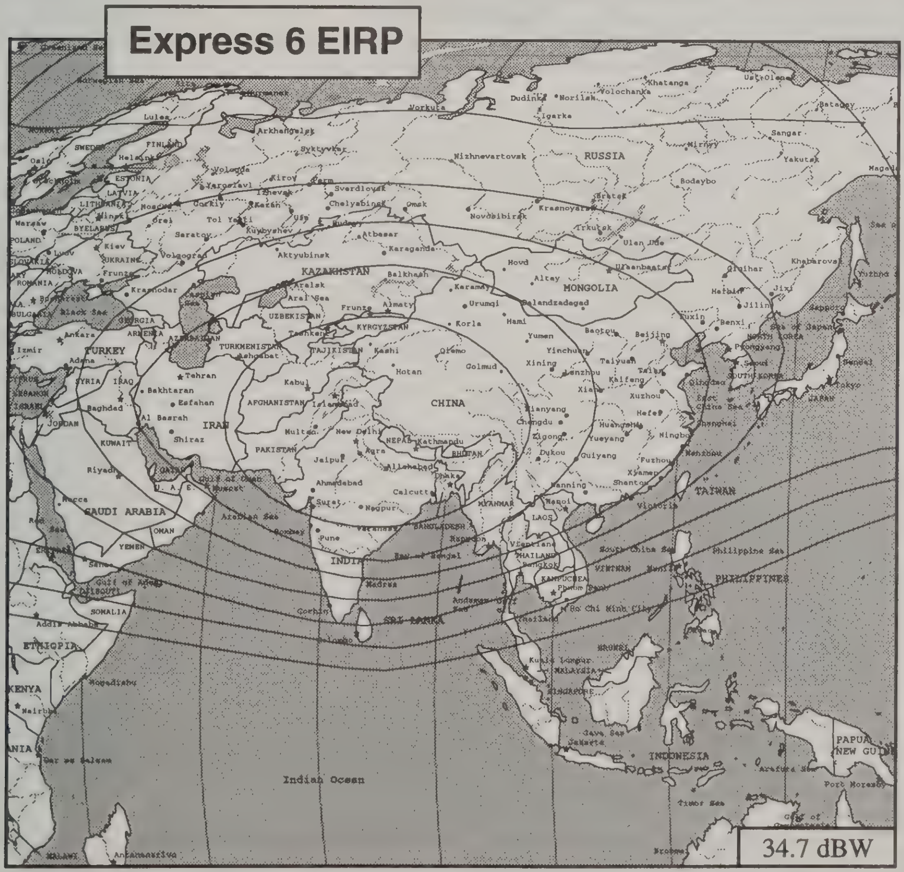
Express 2 EIRP

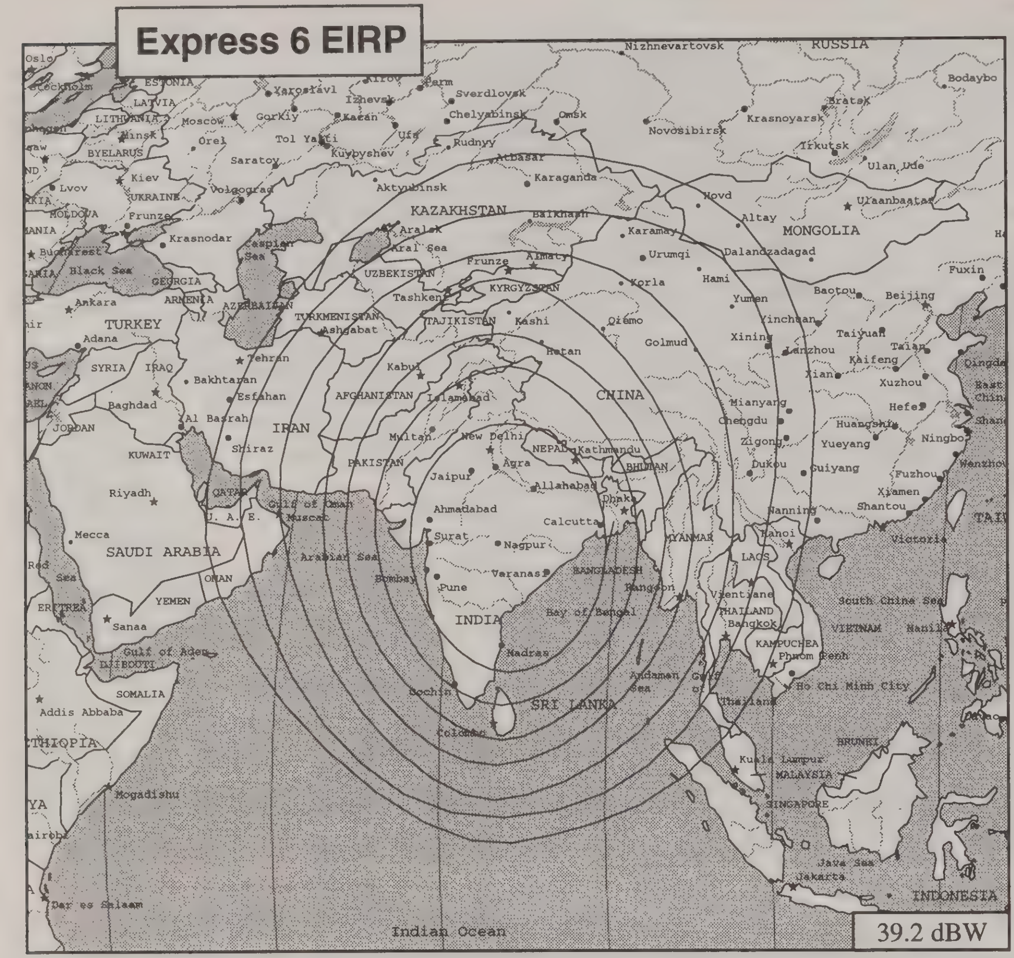



Express 2 EIRP
28.9 dBW
North Atlantic Ocean
Canary Islands
South Atlantic Ocean
CANADA
ALGERIA
LIBYA
EGYPT
MAURITANIA
MALI
NIGER
CHAD
SUDAN
NIGERIA
ETHIOPIA
ZAIRE
KENYA
TANZANIA
ANGOLA
ZAMBIA
NAMIBIA
SOUTH AFRICA
TURKEY
SAUDI ARABIA
VENEZUELA
COLOMBIA
PERU
BRAZIL
BOLIVIA
PARAGUAY
CHILE
ARGENTINA
FALKLAND ISLANDS
SOUTH GEORGIA ISLAND


Express 2 EIRP
39.2 dBW
Omaha
Chicago
Kansas City
U.S.A.
St. Louis
Philadelphia
New York
Washington D.C.
Norfolk
Memphis
Charlotte
Dallas
Birmingham
Houston
New Orleans
Jacksonville
Tampa
Gulf of Mexico
MEXICO
Mexico City
Havana
CUBA
THE BAHAMAS
DOM. REP.
JAMAICA
HAITI
BELIZE
HONDURAS
GUATEMALA
EL SALVADOR
NICARAGUA
COSTA RICA
PANAMA
Caribbean Sea
North Atlantic Ocean
Ponta Delgada
Canary Islands
WESTERN SAHARA
Praia
SENEGAL
GAMBIA
GUINEA BISSAU
Caracas
VENEZUELA
GUYANA
SURINAME
FRENCH GUIANA
Bogota
COLOMBIA
ECUADOR
Quito
Manaus
Belem
Fortaleza
Sao Goncalo
Talara
Trujillo
Porto Velho
Cachimbo
Recife
Lima
PERU
BRAZIL
Barreiras
Salvador
La Paz
Cuiaba
Brasilia
BOLIVIA
Goiania
Sucre
Belo Horizonte
Antofagasta
PARAGUAY
Campinas
Rio De Janeiro
Curitiba
Sao Paulo
Asuncion


Express 6 EIRP
28.9 dBW
KAZAKHSTAN
MONGOLIA
CHINA
TURKEY
IRAN
SAUDI ARABIA
AFGHANISTAN
PAKISTAN
INDIA
SRI LANKA
TAIWAN
PHILIPPINES
MALAYSIA
INDONESIA
PAPUA NEW GUINEA
AUSTRALIA
NEW CALEDONIA
NEW ZEALAND
JAPAN
ETHIOPIA
SOMALIA
KENYA
MADAGASCAR
Indian Ocean
South China Sea
Bay of Bengal
Arabian Sea
Coral Sea
Tasman Sea
Timor Sea
Alice Springs
Tennant Creek


Express 6 EIRP
34.7 dBW
RUSSIA
FINLAND
SWEDEN
NORWAY
ESTONIA
LATVIA
LITHUANIA
BYELARUS
POLAND
UKRAINE
ROMANIA
BULGARIA
GEORGIA
ARMENIA
AZERBAIJAN
KAZAKHSTAN
UZBEKISTAN
TURKMENISTAN
KYRGYZSTAN
TAJIKISTAN
MONGOLIA
CHINA
NORTH KOREA
SOUTH KOREA
JAPAN
TURKEY
SYRIA
IRAQ
IRAN
JORDAN
KUWAIT
SAUDI ARABIA
OMAN
YEMEN
AFGHANISTAN
PAKISTAN
NEPAL
BHUTAN
INDIA
BANGLADESH
MYANMAR
LAOS
THAILAND
KAMPUCHEA
VIETNAM
SRI LANKA
TAIWAN
PHILIPPINES
MALAYSIA
BRUNEI
SINGAPORE
INDONESIA
PAPUA NEW GUINEA
SOMALIA
ETHIOPIA
KENYA
Indian Ocean
Arabian Sea
Bay of Bengal
South China Sea
Philippine Sea
Timor Sea
Arafura Sea



Express 6 EIRP

39.2 dBW

GALS SYSTEM At A Glance

- Satellite name: Gals 1, 36°E; Gals 2, 36°E
- Spacecraft data:
  - Area of coverage: CIS
  - Mass: 2,500 kg
  - Launch date: January 20, 1994 (1), November 17, 1995 (2)
  - Launch vehicle: Proton
  - Expected lifetime: 5-7 years
  - Transponders:
    - Number: 3
    - Frequency band: 11.8042-12.2837 GHz
    - EIRP: 57 dBW
    - G/T: 0 dB/K
  - Manufacturer: NPO-PM

RIMSAT SYSTEM At A Glance

Satellite name:	Rimsat G1 (a relocated Gorizont at 134°E); Rimsat G2 (a new Gorizont at 142.5°E); Rimsat 4,5,6,7 (new Express satellites, to be launched, orbital location to be determined)
Spacecraft data:	
Mass (in orbit):	2,200 kg (G1, G2); 2,400 kg (4, 5, 6,. 7)
Primary power (EOL):	1,280 kg (G1, G2); 2,400 W (4, 5, 6, 7)
Eclipse protection:	Yes
Stabilization:	3 axis
Launch date:	1993 (Rimsat G1); May 20, 1994 (Rimsat G2); TBD (Rimsat 4, 5, 6, 7)
Launch vehicle:	Proton
Expected lifetime:	4 years (G1, G2), 7 years (4, 5, 6, 7)
Transponders:	
Number:	Gorizont: 6 C-band, 1 Ku-band (Rimsat 1 and 2); Express: 10 C-band, 2 Ku-band (Rimsat 3-7)
Bandwidth:	34 MHz
EIRP:	45 dBW (C-band), 38 dBW (Ku-band)
Redundancy:	1:1 for all transponders
Single carrier saturation flux density:	-78 to -98 dBW/m^2
Manufacturer:	NPO-PM

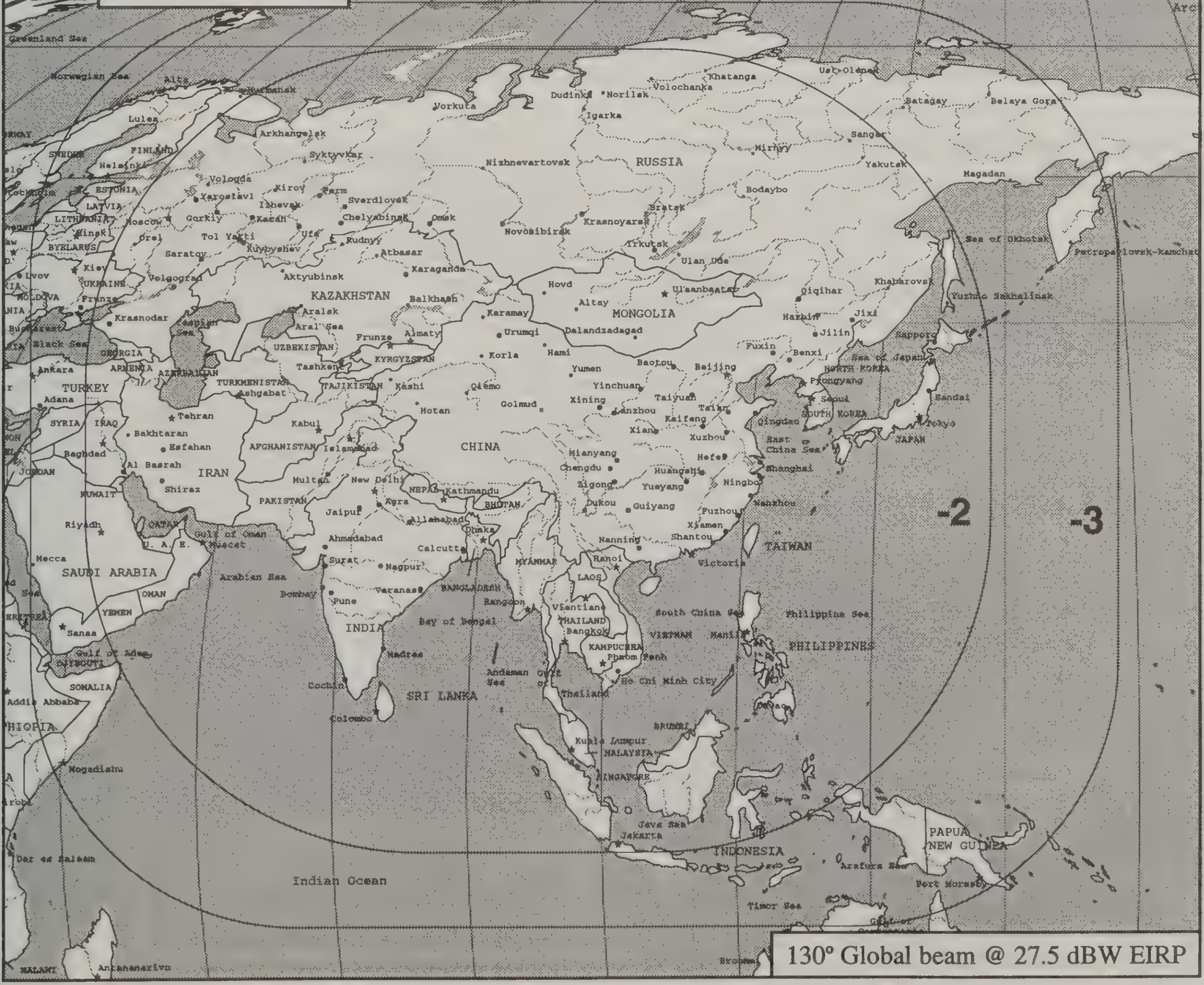
Rimsat

Orbital location:	134ºE (Rimsat G1); 142.5ºE (Rimsat G2); TBD (Rimsat 4, Rimsat 5, Rimsat 6, Rimsat 7)
Launch:	1993 (Rimsat G1); May 20, 1994 (Rimsat G2); TBD (Rimsat 4, Rimsat 5, Rimsat 6, Rimsat 7)
Expected lifetime:	4 years (G1, G2), 7 years (4, 5, 6, 7)
Expected end of life:	1997 (G1), 1998 (G2)

Antennas beam coverage overview:

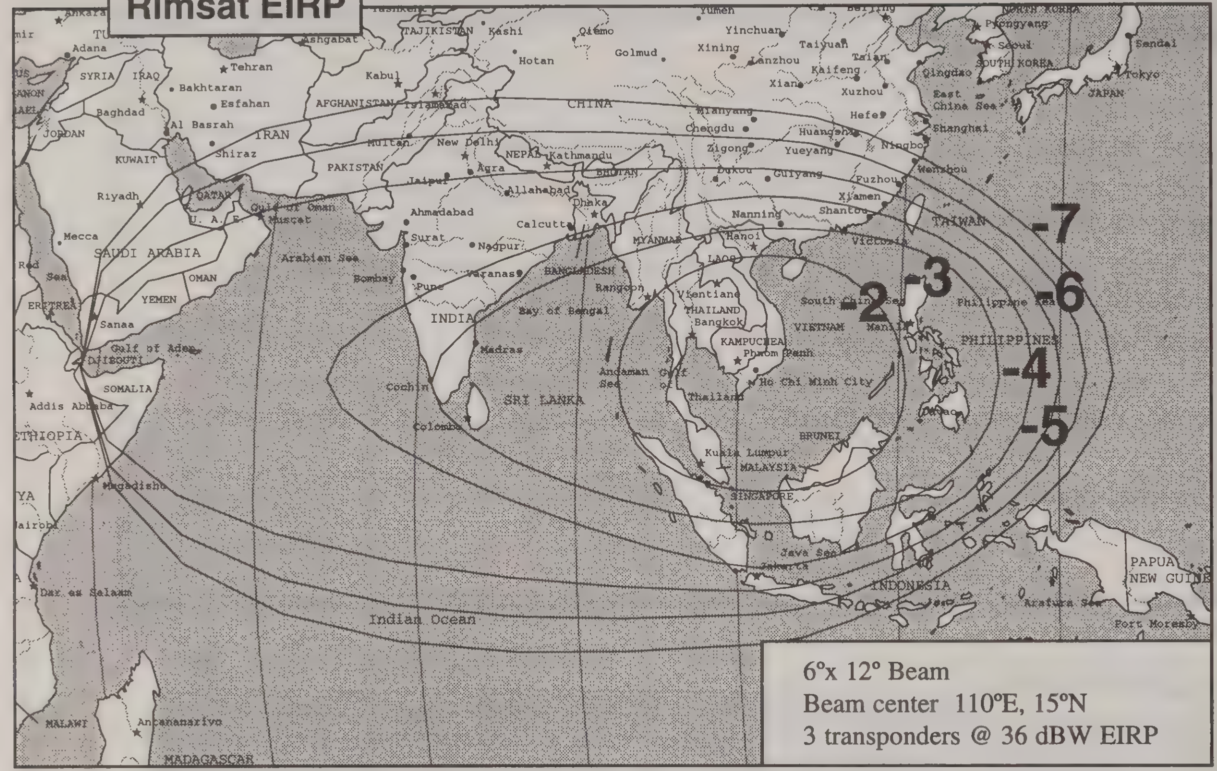
Ku-band; C-band:	Asia

Rimsat EIRP



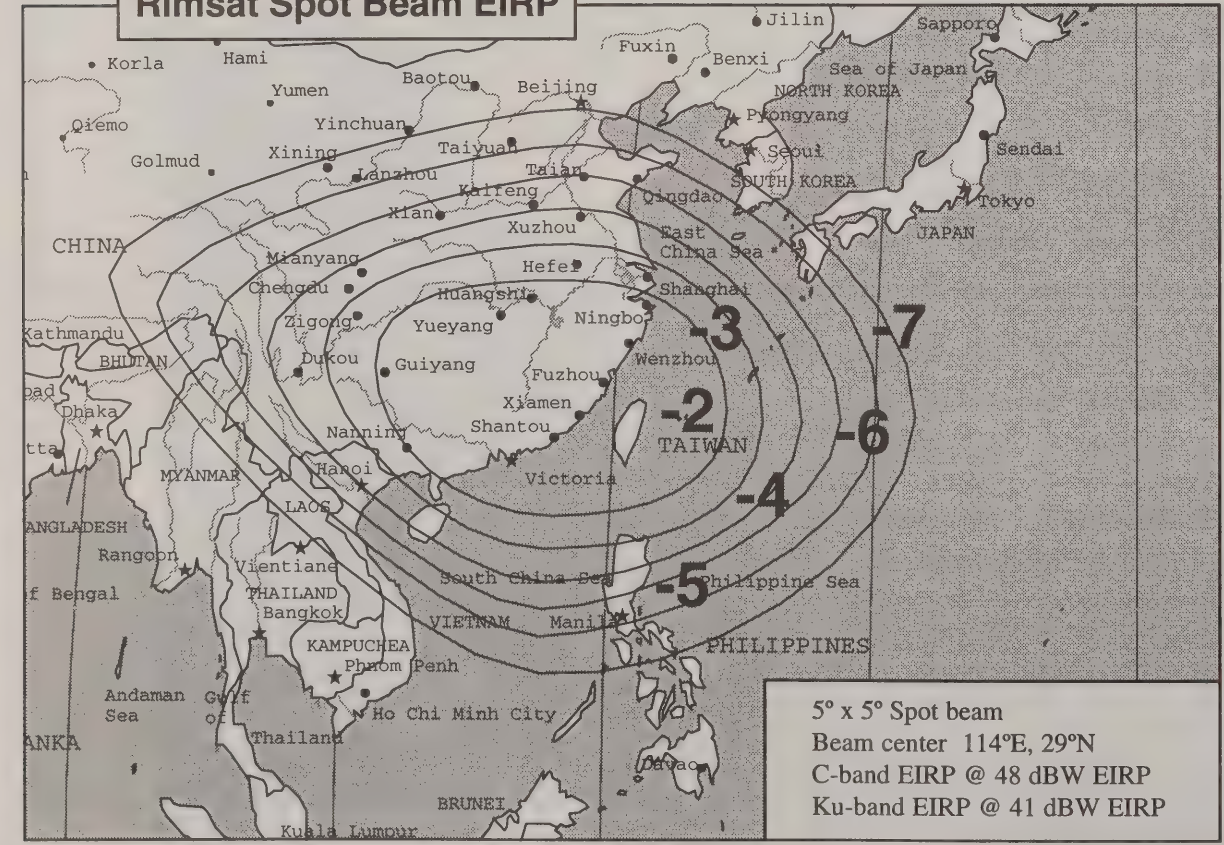
130° Global beam @ 27.5 dBW EIRP

Rimsat EIRP



6°x 12° Beam
Beam center 110°E, 15°N
3 transponders @ 36 dBW EIRP

Rimsat Spot Beam EIRP



5° x 5° Spot beam
Beam center 114°E, 29°N
C-band EIRP @ 48 dBW EIRP
Ku-band EIRP @ 41 dBW EIRP

INTERSPUTNIK 8 SYSTEM At A Glance

Satellite name:	Intersputnik 8-1, 344°E (16°W) [to be launched]; Intersputnik 8-2, 75°E (to be launched)
Spacecraft data:	
Area of coverage:	Latin America, Africa, Asia, and the Pacific Rim (C-band); Caribbean, Western Europe, Southern Africa, Central Asia, India and Southeast Asia (Ku-band)
Mass (at launch):	3,500 kg
Launch date:	1997 or early 1998
Launch vehicle:	Ariane or Proton
Transponders:	
Number:	24 C-band; 16 Ku-band
Bandwidth:	36, 54 and 72 MHz
EIRP:	40 dBW @ beam center (C-band); 51 to 53 dBW (Ku-band spot beams)
Manufacturer:	Space Systems/Loral

ORION ATLANTIC, L.P.

Satellite Services 2440 Research Boulevard Suite 400 Rockville, MD 20850 USA	Telephone: Facsimile:	(301)258-8101 (301)258-3222

Booking Contact:

Ruth Burke, Booking Coordinator

Contacts:

Jack Albert, Senior Vice President and General Manager, Satellite Services
Arthur Hill, II, Executive Director, Satellite Sales

Overview:

Orion Atlantic, L.P. launched its first international communications satellite, Orion 1, on November 29, 1994. From its Atlantic Ocean orbital position 322.5° East, the satellite provides Ku-band capacity services with coverage in Europe and North America. Some of the more distinct features of Orion 1 communications capabilities include 34 Ku-band transponders, multiple spot beams and broad beam coverages and high gain antennas supporting low-cost ground equipment. Plans for Orion 2 are under way and a mid-1999 launch is scheduled.

Services Offered:

- Trans-Atlantic and pan-European Ku-band satellite capacity services to radio and television broadcasters, cable programmers, multiple system operators (MSOs), carriers and telecommunications service providers
- MCPC & SCPC digital video
- Gateway MCPC facilities in London for Transatlantic or Pan-European transmission services
- Full time, part time and occasional use digital video services

ORION SYSTEM At A Glance

Satellite name:	Orion 1, 322.5°E (37.5°W); Orion 2, 348°E (12°W) [to be launched]; Orion 3, 139°E (to be launched)
Spacecraft data:	
Area of coverage:	Between and within North America and Europe (1); North America, South America, Europe, Russia, Middle East, and South Africa (2); Northeast Asia, Southeast Asia, India, Australia, New Zealand, and Hawaii (3)
Mass (in orbit, BOL):	2,340 kg
Primary power:	3,100 W (Full eclipse capability)
Eclipse protection:	All transponders
Stabilization:	3-axis
Launch date:	November 29, 1994 (1); mid-1999 (2); November 1, 1998 (3)
Launch vehicle	Martin Marietta Atlas IIA (1 and 2); Delta 3 (3)
Expected lifetime:	11 years
Transponders:	
Number:	28 @ 54 MHz; 6 @ 36 MHz divided equally between North America and European coverage areas (1); 30 Ku-band @ 54 MHz (2); 23 Ku-band @ 54 MHz + 2 @ 27 MHz, 10 C-band @ 36 MHz (3)
Power output:	15 W TWTA
Polarization:	Dual linear with spatial diversity
Redundancy:	Block with six spare amplifiers
Uplink frequency:	14.0-14.5 GHz
Downlink frequency:	11.45-11.7 GHz, 12.5-12.75 GHz (Europe); 11.7-12.2 GHz (USA)
EIRP:	Up to 48 dBW (broad beams); Up to 54 dBW (spot beams)
G/T:	+2 to +12 dB/K
Uplink G/T:	North American uplinks: -3 to +8 dB/K European uplinks: -10 to +10 dB/K

ORION SYSTEM At A Glance (continued)

Antenna beams:	North America: four downlink beams-northeastern, northern, central, southern in vertical with one broad beam in horizontal polarization. Europe: three downlink spot beams-northern, central, southern in horizontal with one broad beam in vertical polarization.
Saturation flux density range:	-80 to -100 dBW/m^2
Manufacturer:	Matra Marconi Space (1 and 2); Hughes Space & Communications (3)

Orion 1 European Transponder Frequency Plan

Broad Beam

Tr.#	Pol.	BW(MHz)	Uplink(GHz)	Downlink(GHz)
1	H up, V down	54	14.028	12.528
2	H up, V down	54	14.091	12.591
3	H up, V down	54	14.154	12.654
4	H up, V down	54	14.217	12.717
5	H up, V down	54	14.278	11.483
6	H up, V down	54	14.341	11.546
7	H up, V down	54	14.404	11.609
8	H up, V down	54	14.467	11.672
Spot Beam				
9	V up, H down	54	14.028	12.528
10	V up, H down	54	14.091	12.591
11	V up, H down	54	14.145	12.645
12	N/A up, H down	54	14.1855	12.6855
13	V up, H down	54	14.226	12.726
14	V up, H down	54	14.278	11.483
15	N/A up, H down	54	14.341	11.546
16	N/A up, H down	54	14.404	11.609
17	N/A up, H down	54	14.467	11.672

Orion 1 North American Transponder Frequency Plan

Broad Beam

Tr.#	Pol.	BW(MHz)	Uplink(GHz)	Downlink(GHz)
18	V up, H down	54	14.028	11.728
19	V up, H down	54	14.091	11.791
20	V up, H down	54	14.154	11.854
21	V up, H down	54	14.217	11.917
22	V up, H down	54	14.278	11.978
23	V up, H down	54	14.341	12.041
24	V up, H down	54	14.404	12.104
25	N/A up, H down	54	14.467	12.167
Spot Beam				
26	V	54	14.028	11.728
27	V	54	14.091	11.791
28	V	54	14.145	11.854
29	V	54	14.1855	11.8855
30	V	54	14.226	11.926
31	V	54	14.278	11.978
32	V	54	14.341	12.041
33	V	54	14.404	12.104
34	V	54	14.467	12.167

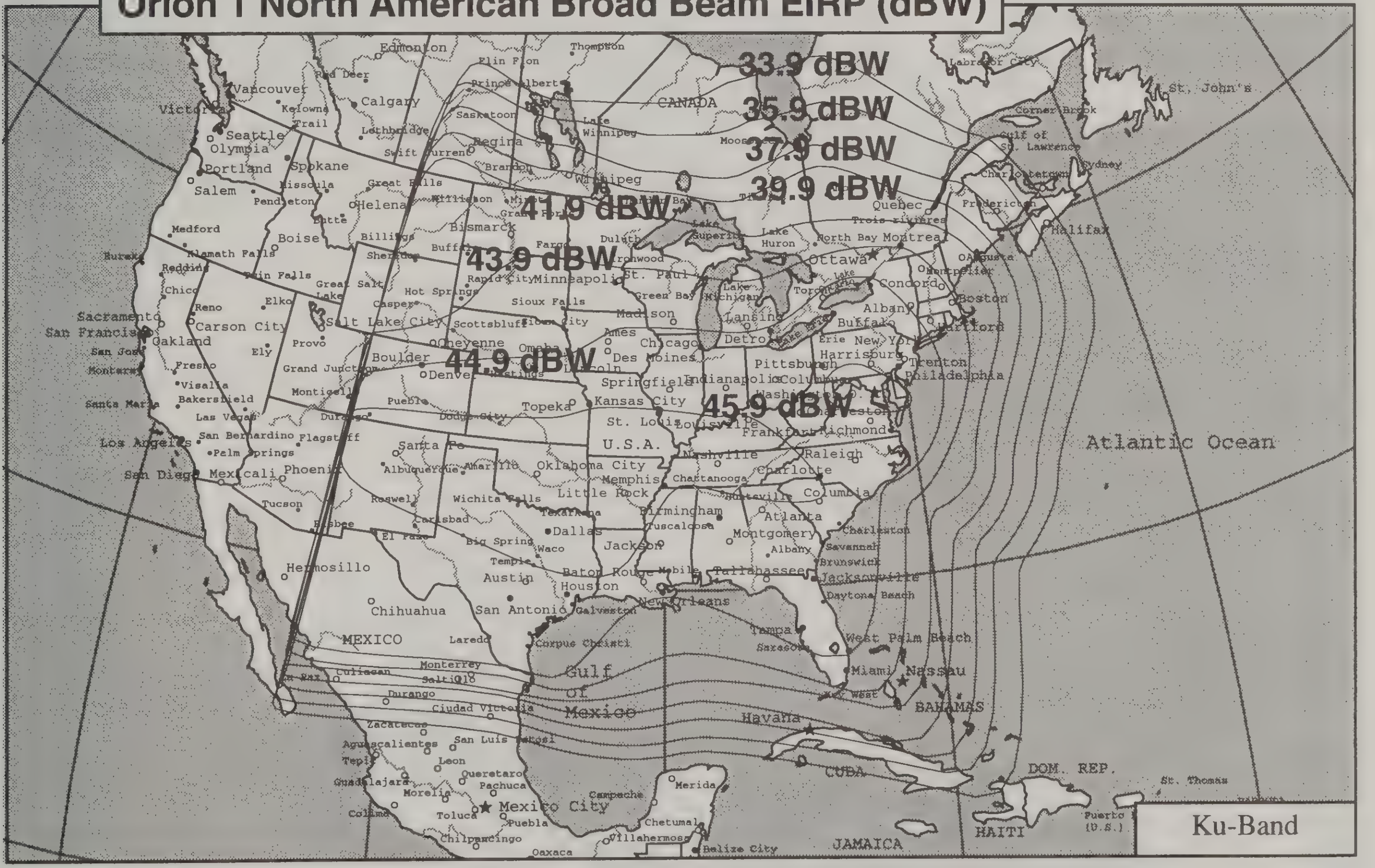
Orion 1

Orbital location:	322.5ºE (37.5°W)
Launch:	November 29, 1994
Launch vehicle:	Martin Marietta Atlas IIA
Expected lifetime:	11 years
Expected end of life:	2006

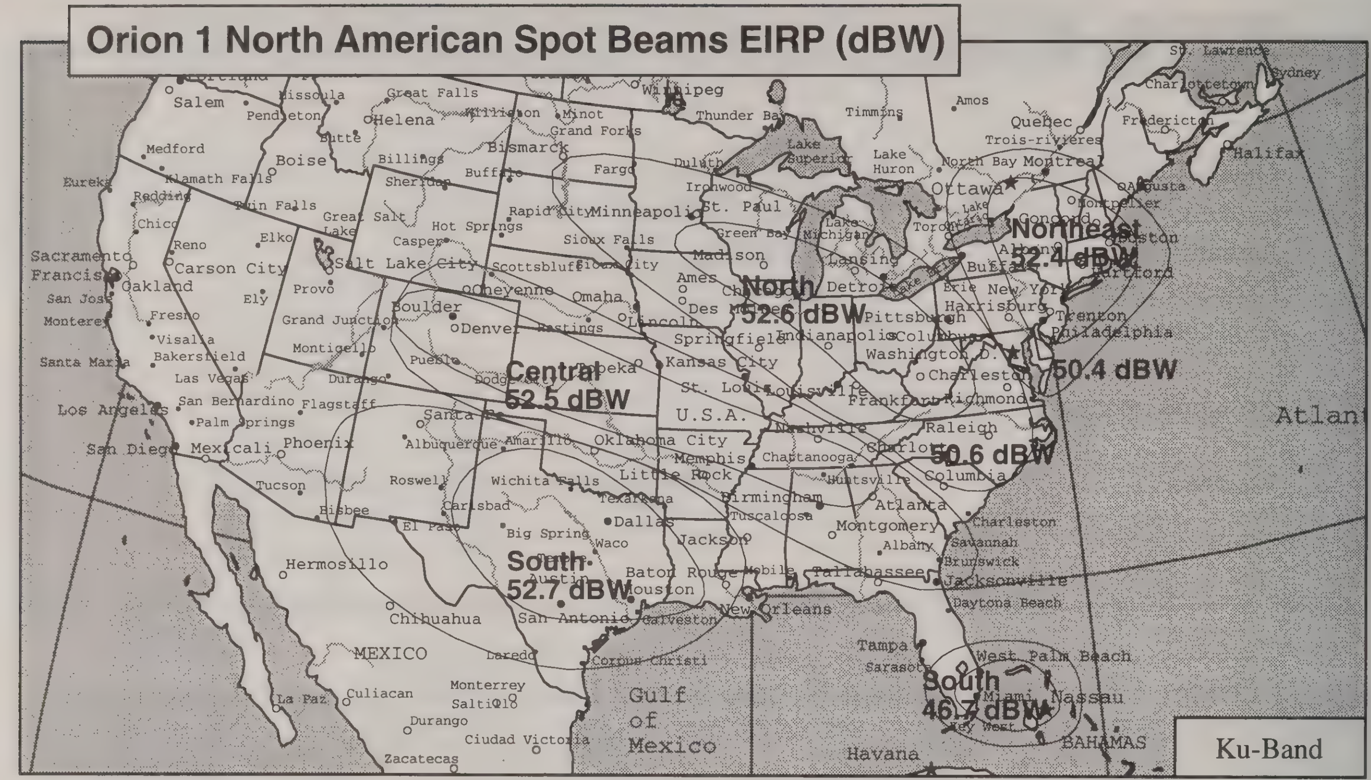
Antennas beam coverage overview:

Ku-band:	Between and within North America and Europe

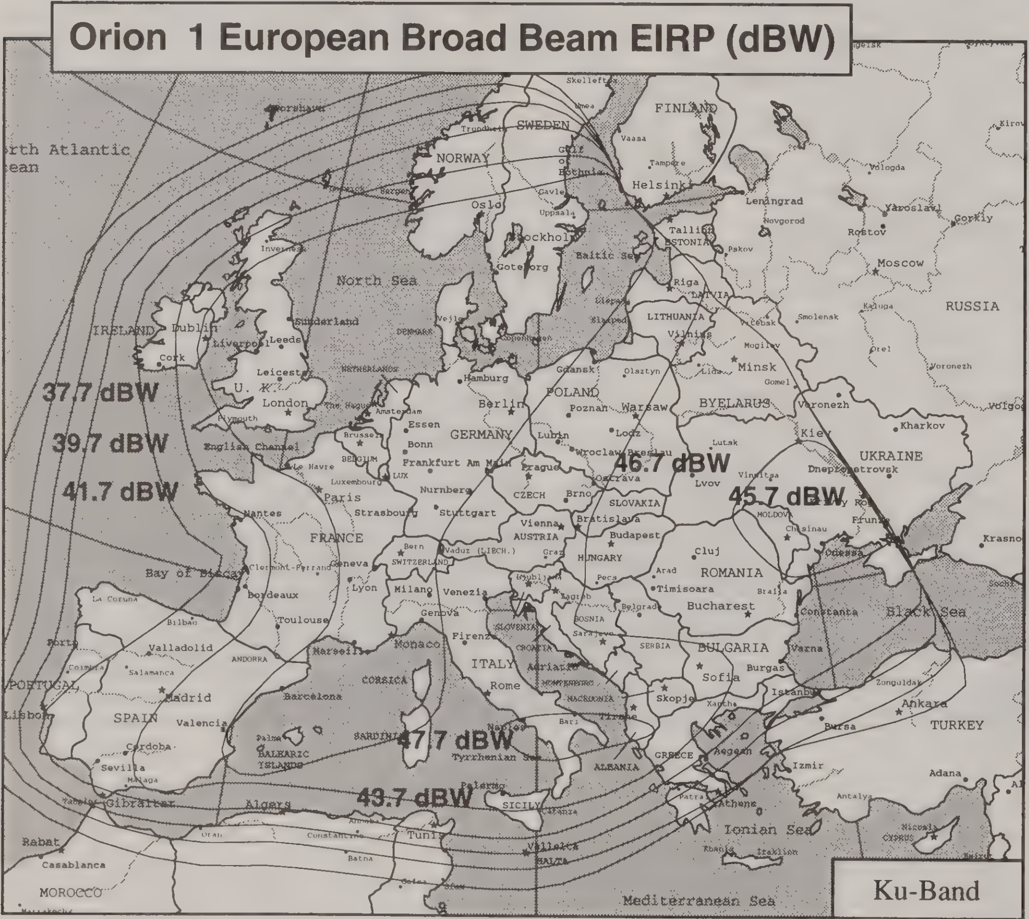
Orion 1 North American Broad Beam EIRP (dBW)

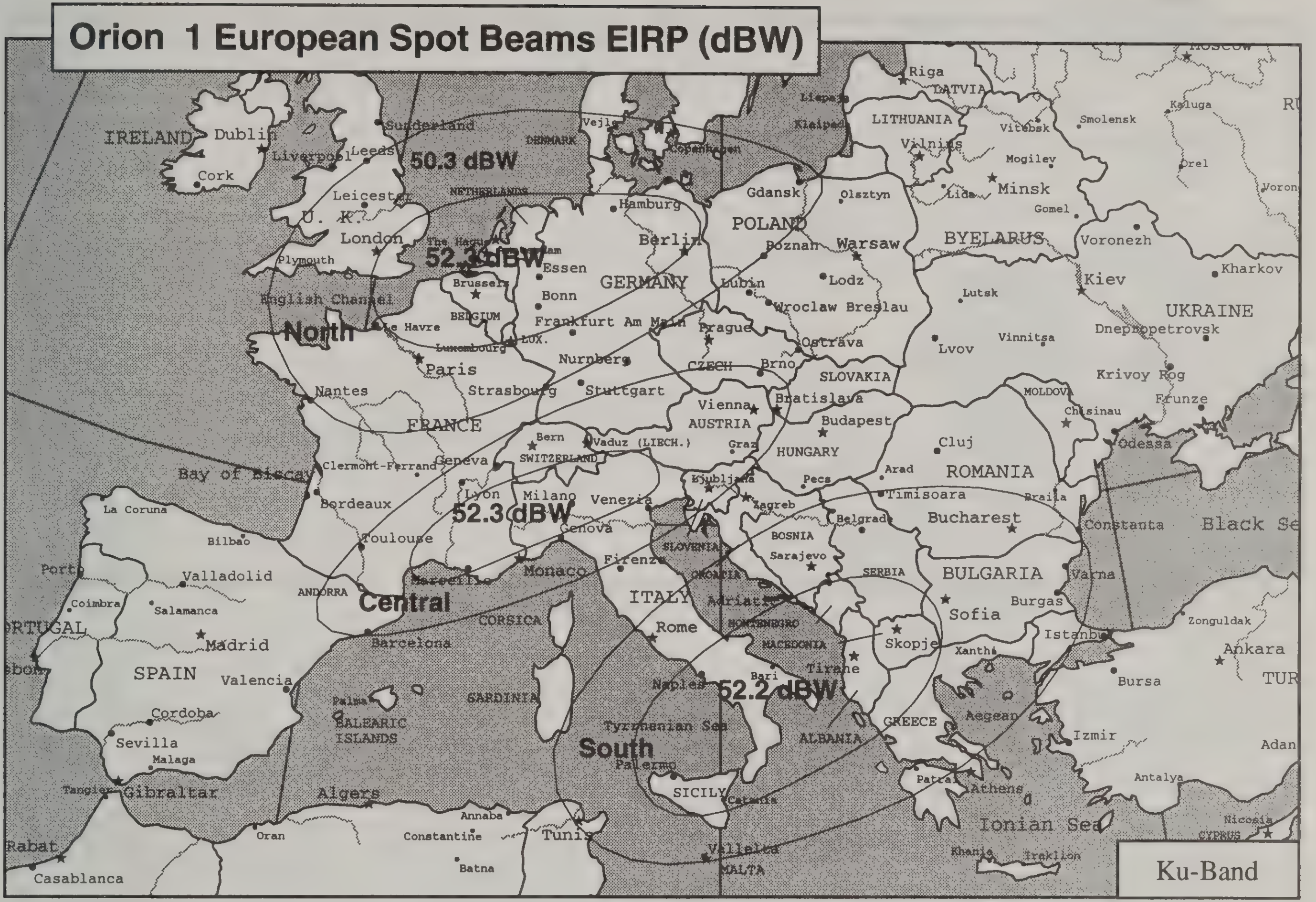


Orion 1 North American Spot Beams EIRP (dBW)



Orion 1 European Broad Beam EIRP (dBW)





Orion 1 European Spot Beams EIRP (dBW)

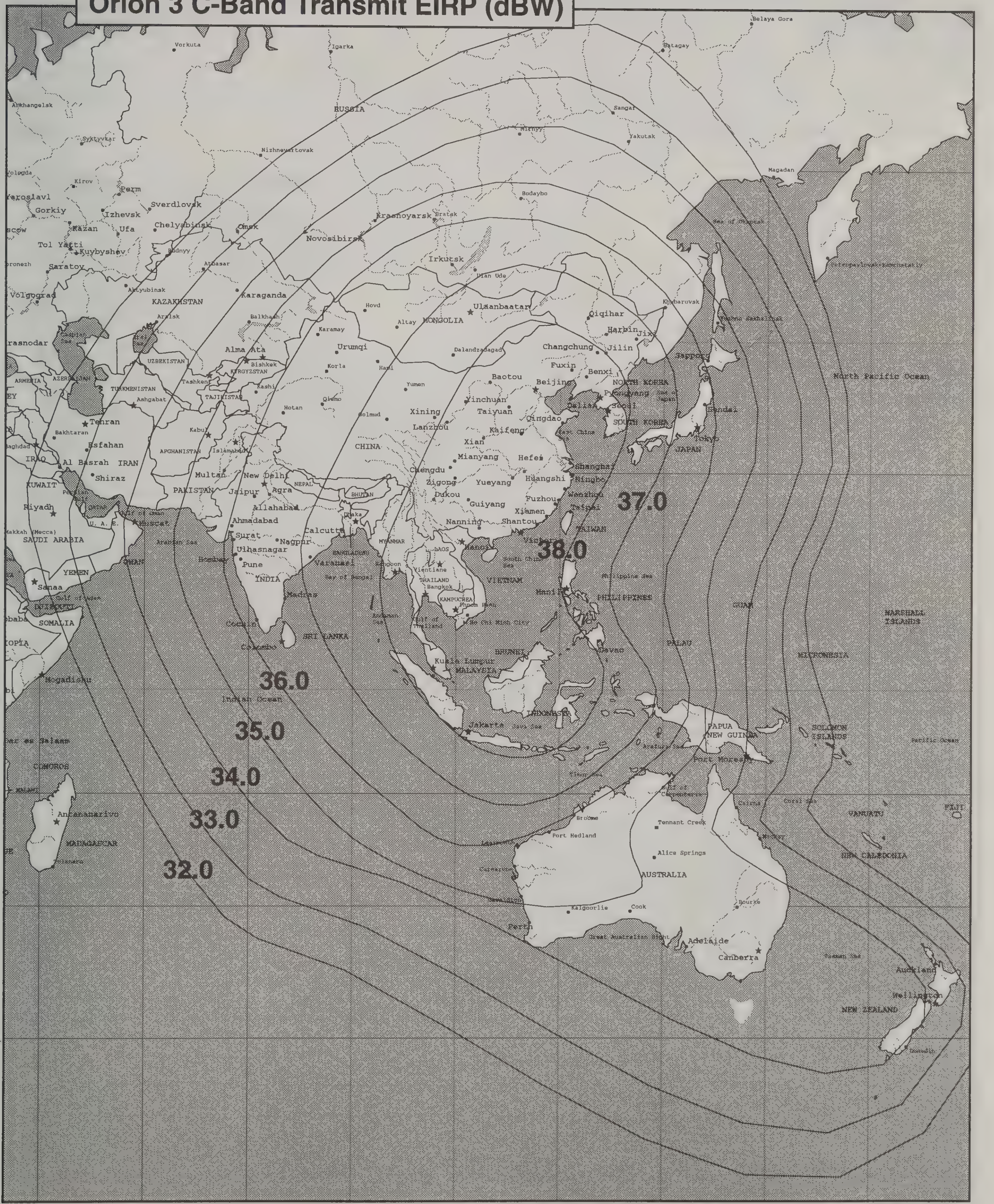
Orion 3

Orbital location:	139°E
Launch:	mid-1999
Launch vehicle:	Delta 3
Expected lifetime:	11 years
Expected end of life:	2010

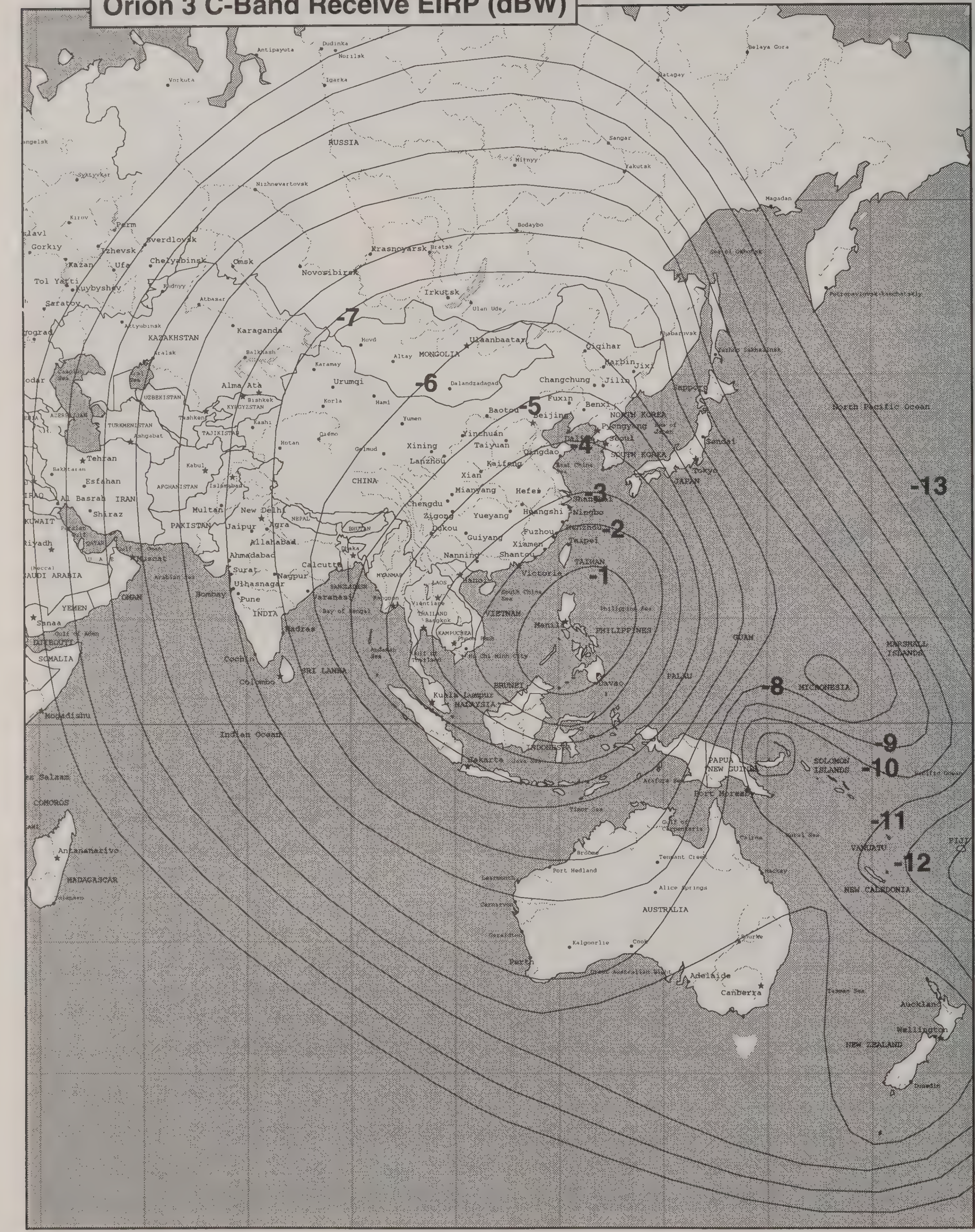
Antennas beam coverage overview:

Ku-band:	Northeast Asia, Southeast Asia, India, Australia, New Zealand, and Hawaii

Orion 3 C-Band Transmit EIRP (dBW)



Orion 3 C-Band Receive EIRP (dBW)



PANAMSAT

One Pickwick Plaza	Telephone: (203)622-6664
Greenwich, CT 06830	Facsimile: (203)622-9163
USA	Web Site Address: www.panamsat.com

Public Relations Contact:

Kevin Burgoyne, Manager of Corporate Communications

Overview:

PanAmSat is the world's first private global satellite service provider. It offers satellite based video and data communications services to more than 285 customers in over 110 countries. PAS-1, the company's first satellite, was launched in 1988 and serves the Atlantic Ocean region. A second Atlantic Ocean region satellite, PAS-3 was launched on January 12, 1996. The PAS-2 satellite, serving the Pacific Ocean region including the western U.S., was launched in July of 1994. The PAS-4 satellite, serving the Indian Ocean region, was launched on August 3, 1995. The company's continued expansion plans include launches in 1997 and 1998 of the PAS-5 (302°E), PAS-6 (317°E), PAS-7 (68.5°E), and PAS-8 (166°E) satellites.

Services Offered:

- Full turnkey services
- Full-time broadcast, radio, program syndication, SNG, special events.
- Point-to-point data circuits, point-to-multipoint video and interactive VSATs (64 kbps to T-1 circuits)
- Business television, program feeds, full-and part-time transmission, point-to-multipoint video, videoconferencing, broadcast radio

Satellite Control Network:

Satellite control:	Homestead, FL
TT&C stations:	Atlanta, GA

International Gateway Earth Stations:

Homestead, FL; Atlanta; Australia; Europe; and California

PAS-1 SYSTEM At A Glance

Satellite name:	PAS-1, 315°E (45°W)
Spacecraft data:	
Mass (in orbit):	1,560 kg
Stabilization:	3-axis
Launch date:	June 15, 1988
Launch vehicle:	Ariane 44LP
Expected lifetime:	13.25 years
Transponders:	
Number:	18 C-band, 6 Ku-band
Power output:	16.2 W TWTA, 8.5 W SSPA (C-band), 16.2 W TWTA (Ku-band)
Polarization:	Linear
G/T:	+0.5 to -13 dB/K (C-band), +0.4 to -11.0 dB/K (Ku-band)
EIRP:	27 to 42 dBW (C-band), 36 to 47 dBW (Ku-band)
Frequency bands:	C-band: Uplink (5.925-6.425 GHz), Downlink: (3.700-4.200 GHz); Ku-band: Uplink (14.000-14.5000 GHz), Downlink: (11.700-12.200 GHz)
Single carrier saturation flux density:	-91 dBW/m^2 Narrow band V, -90 dBW/m^2 Narrow band H, -88 dBW/m^2 Wide band V, -87 dBW/m^2 Wide band H (C-band); -90 dBW/m^2 (Ku-band)
Manufacturer:	Martin Marietta Astrospace (GE Astrospace at time of manufacture)

PAS-1 Transponder Frequency Plan

Tr.#	Pol.	BW(MHz)	EIRP(dBW)	Uplink(GHz)	Downlink(GHz)
1	V	36	25-35*	5.945	3.720
2	V	36	25-35*	5.985	3.760
3	V	36	25-35*	6.025	3.800
4	V	36	25-35*	6.065	3.840
5	V	36	25-35*	6.105	3.880
6	V	36	25-35*	6.145	3.920
7	H	36	25-35*	5.965	3.740
8	H	36	25-35*	6.005	3.780
9	H	36	25-35*	6.045	3.820
10	H	36	25-35*	6.085	3.860
11	H	36	25-35*	6.125	3.900
12	H	36	25-35*	6.165	3.940
13	V	72	25-35*	6.205	3.980
14	V	72	25-35*	6.285	4.060
15	V	72	25-35*	6.365	4.140
16	H	72	25-35*	6.225	4.000
17	H	72	25-35*	6.305	4.080
18	H	72	25-35*	6.385	4.160
19	H	72	25-35*	14.040	11.500
20	H	72	25-35*	14.120	11.580
21	H	72	25-35*	14.200	11.660
22	H	72	25-35*	14.280	11.790
23	H	72	25-35*	14.360	11.820
24	H	72	25-35*	14.440	11.900

* Continental beam; spot beams: 34-39 dBW

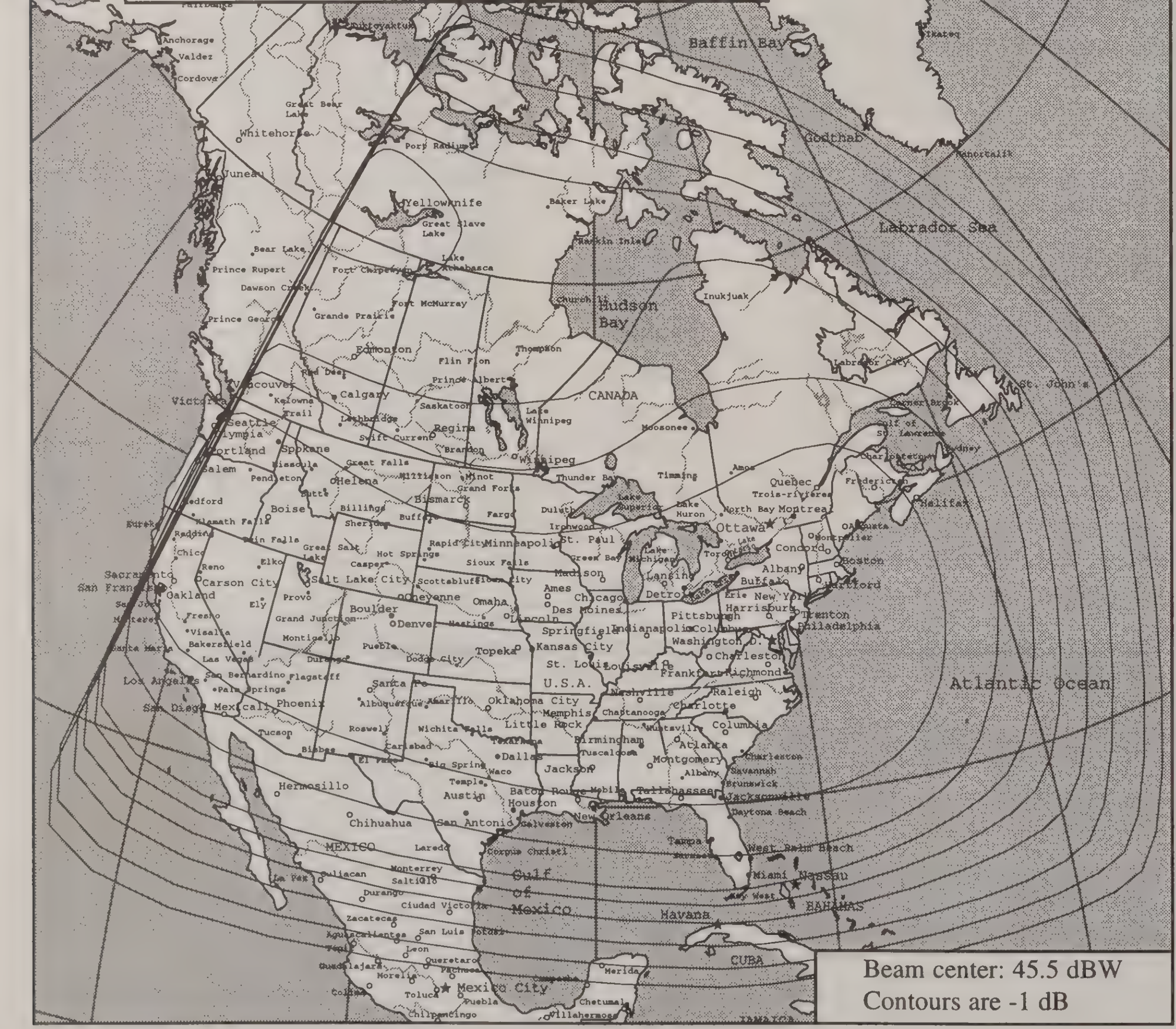
PAS-1

Orbital location:	315ºE (45°W)
Launch:	June 15, 1988, Ariane 44LP
Expected lifetime:	13.25 years
Expected end of life:	2001

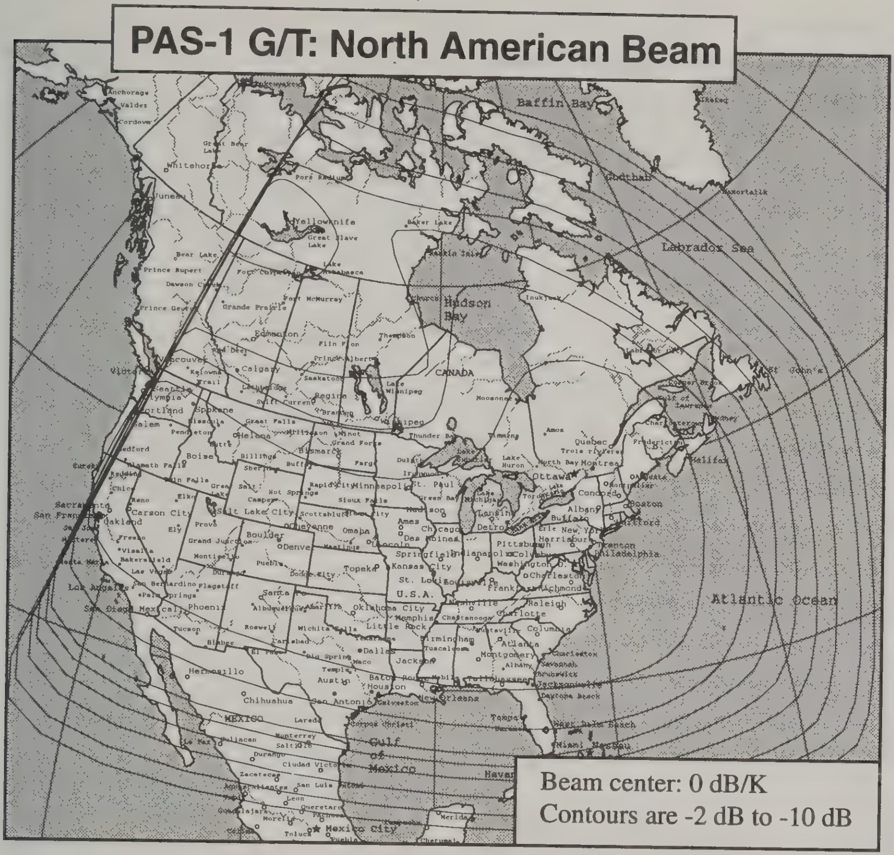
Antennas beam coverage overview:

C-band continental beam:	Central and South America, the Caribbean
C-band spot beam:	North, Central and South America
Ku-band spot beam:	Western Europe, North America

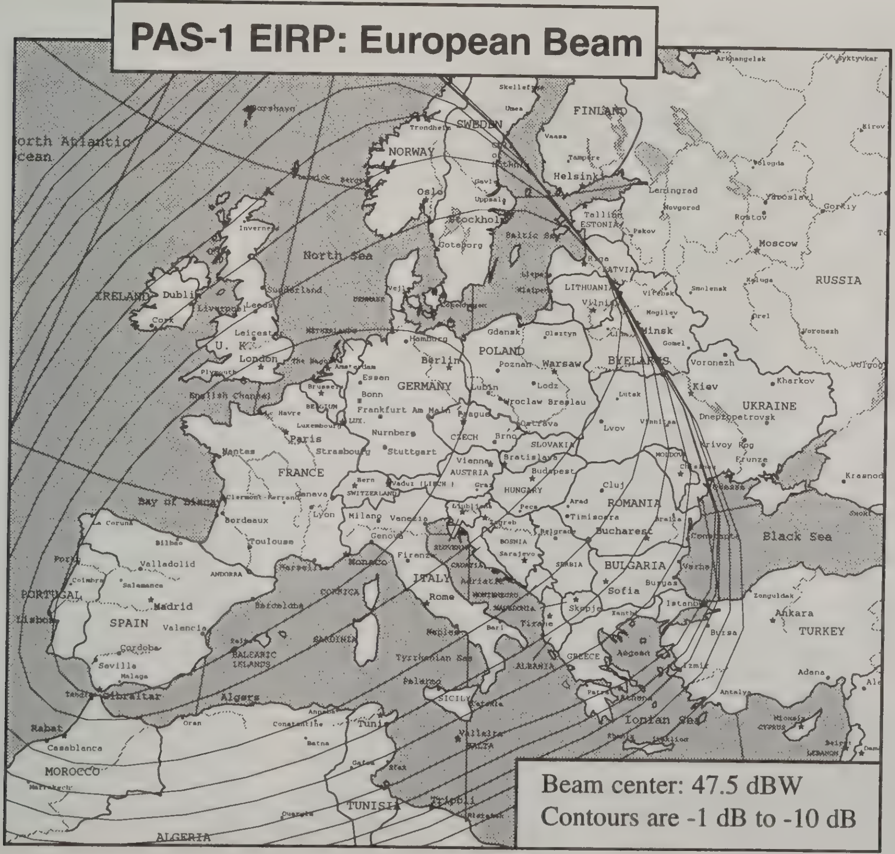
PAS-1 EIRP: North American Beam



Beam center: 45.5 dBW
Contours are -1 dB

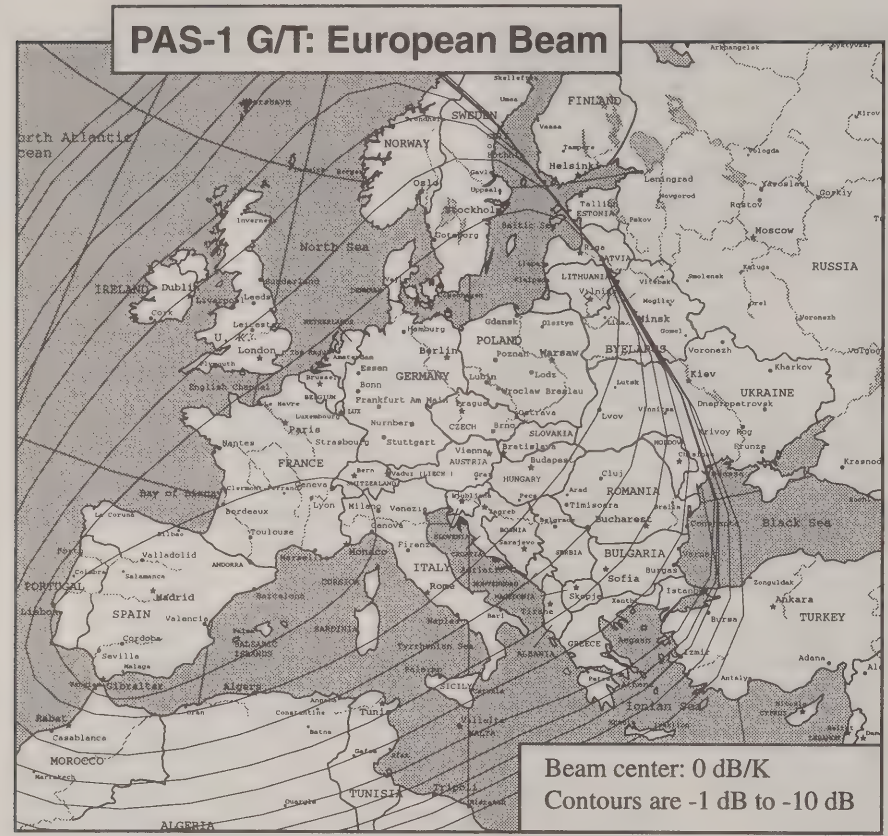

PAS-1 G/T: North American Beam

Beam center: 0 dB/K
Contours are -2 dB to -10 dB


PAS-1 EIRP: European Beam

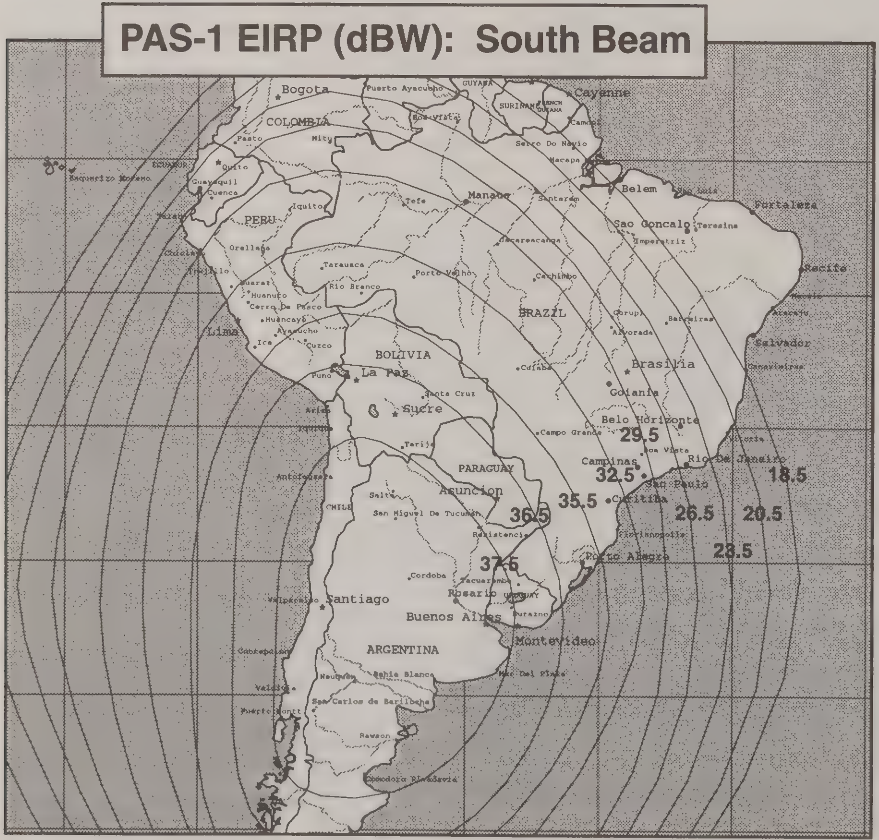
Beam center: 47.5 dBW
Contours are -1 dB to -10 dB

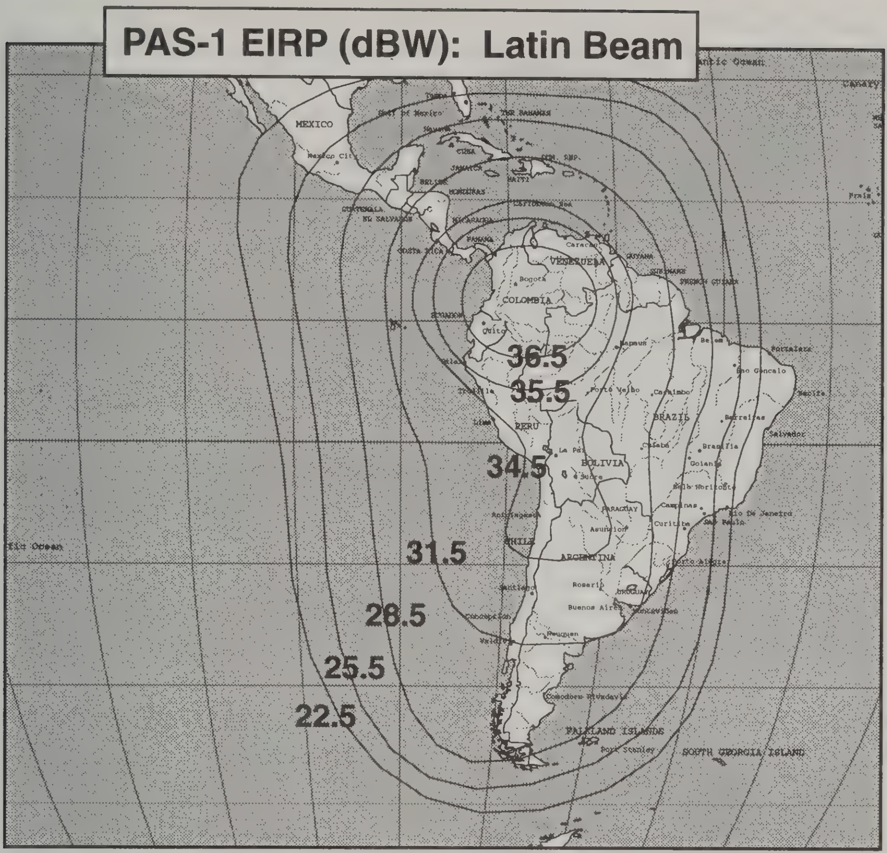
PAS-1 G/T: European Beam



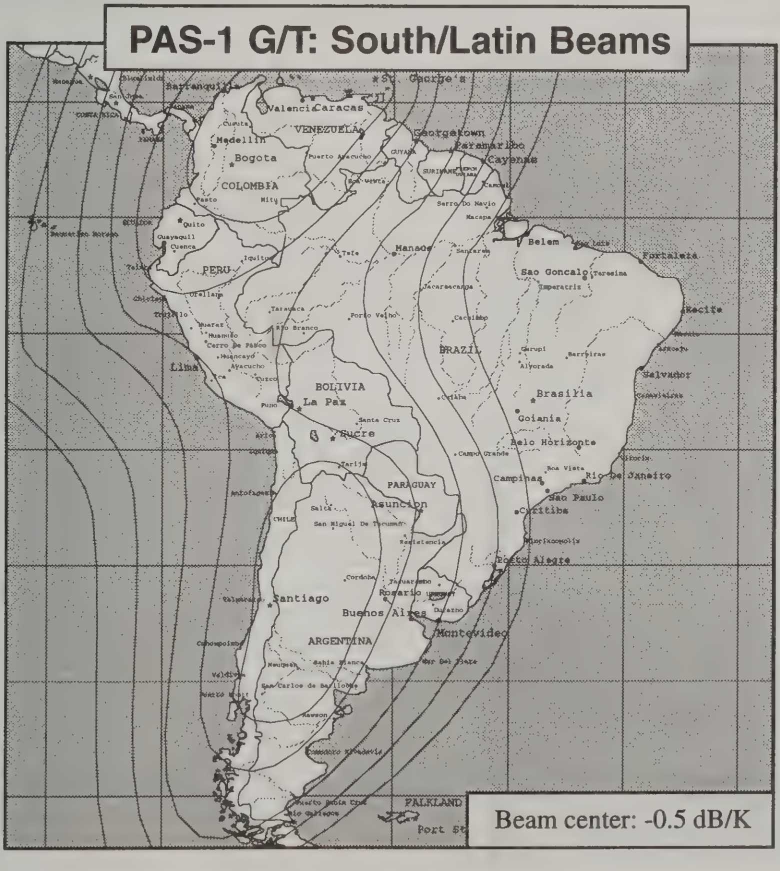
Beam center: 0 dB/K
Contours are -1 dB to -10 dB

PAS-1 EIRP (dBW): South Beam





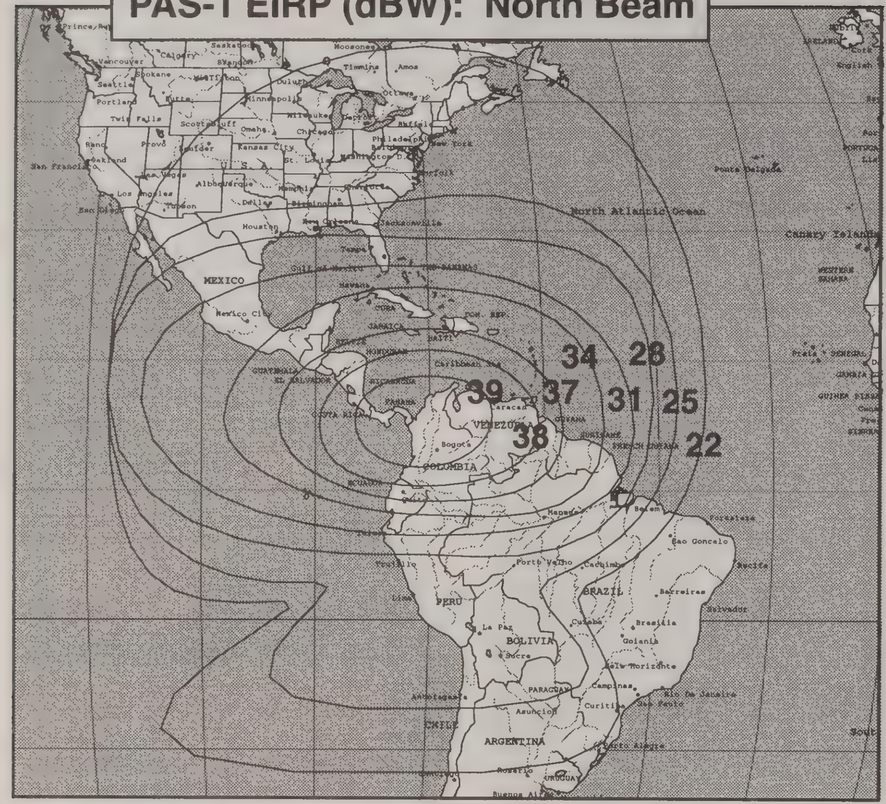
PAS-1 EIRP (dBW): Latin Beam



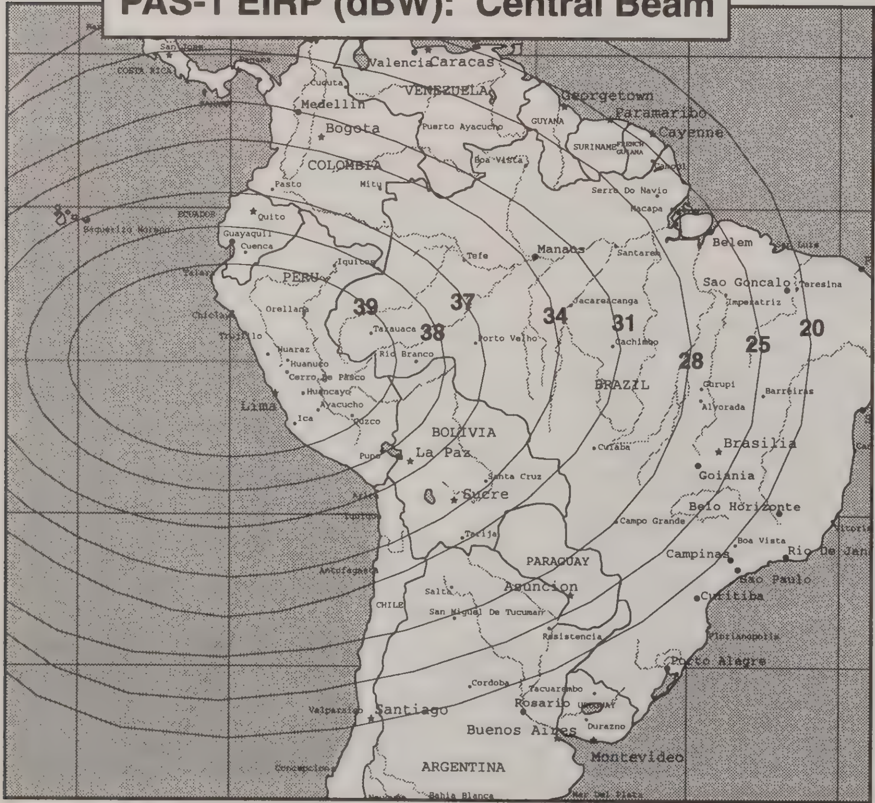
PAS-1 G/T: South/Latin Beams

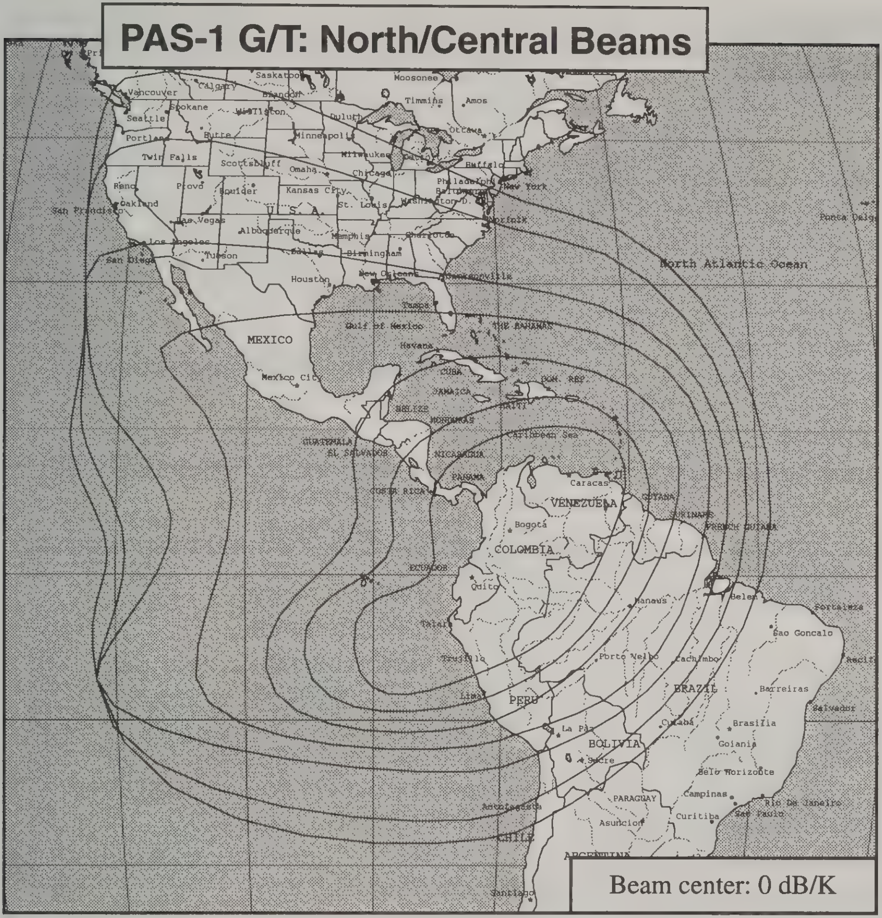
Beam center: -0.5 dB/K

PAS-1 EIRP (dBW): North Beam



PAS-1 EIRP (dBW): Central Beam





PAS-1 G/T: North/Central Beams

Beam center: 0 dB/K

PAS-2 SYSTEM At A Glance

Satellite name:	PAS-2, 169°E
Spacecraft data:	
Stabilization:	3-axis
Launch date:	July 8, 1994
Launch vehicle:	Ariane 44L
Expected lifetime:	15 years
Beam configuration:	Beam-shaped regional and spot beams
Transponders:	
Number:	16 C-band (8H, 8V), 16 Ku-band (8H, 8V)
Power Output:	34 W SSPA (C-band), 63 W TWTA (Ku-band)
Polarization:	Linear
G/T:	+12 to -12 dB/K (C-band), +3 to -7 dB/K (Ku-band)
EIRP:	27 to 41 dBW (C-band), 40 to 54 dBW (Ku-band)
Frequency bands:	C-band: Uplink (5.925-6.425 GHz), Downlink (3.700-4.200 GHz) Ku-band: Uplink (14.000-14.5000 GHz), Downlink (12.250-12.750 GHz)
Single carrier saturation flux density:	-98.8 dBW/m^2 (C-band), -90.4 dBW/m^2 (Ku-band)
Manufacturer:	Hughes

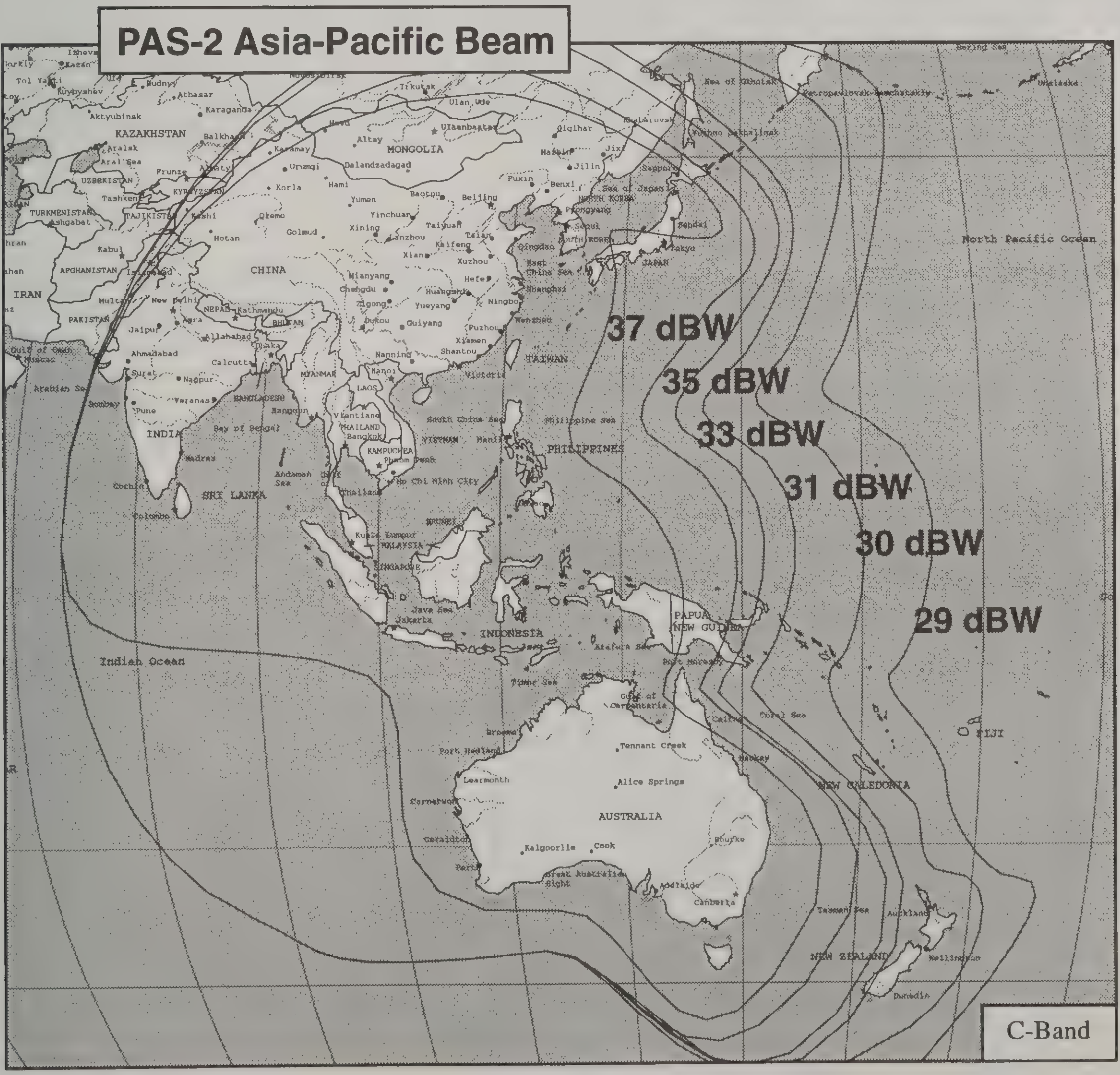
PAS-2

Orbital location: 169ºE
Launch: July 8, 1994, Ariane 44L
Expected lifetime: 15 years
Expected end of life: 2009

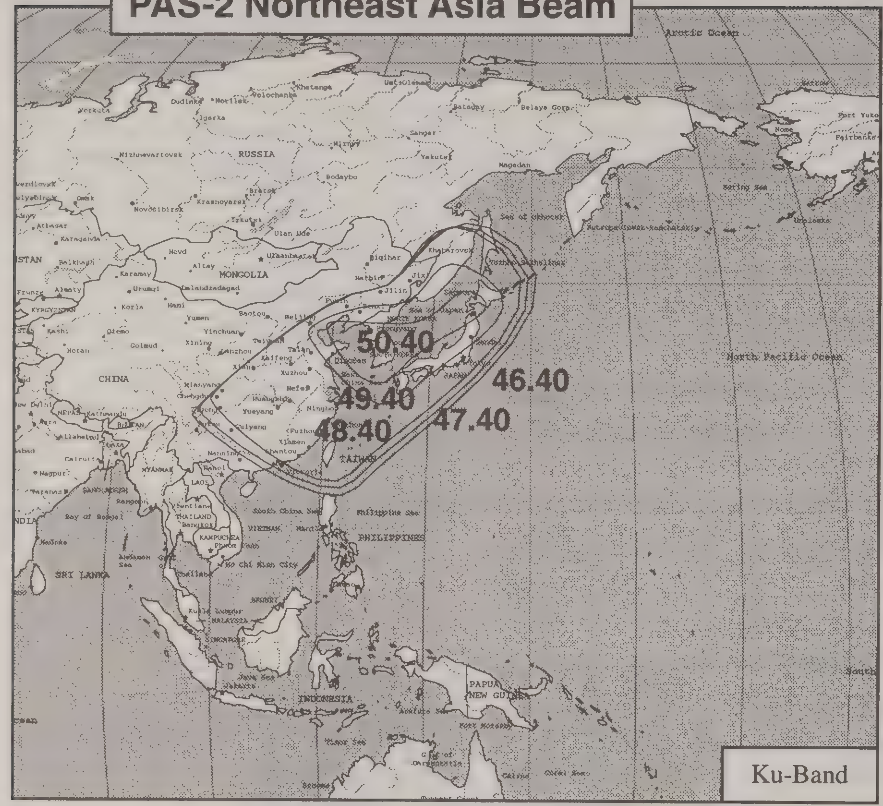
Antennas beam coverage overview:

C-band: Asia-Pacific, Oceania
Ku-band: Northeast Asia, China, Australia, New Zealand

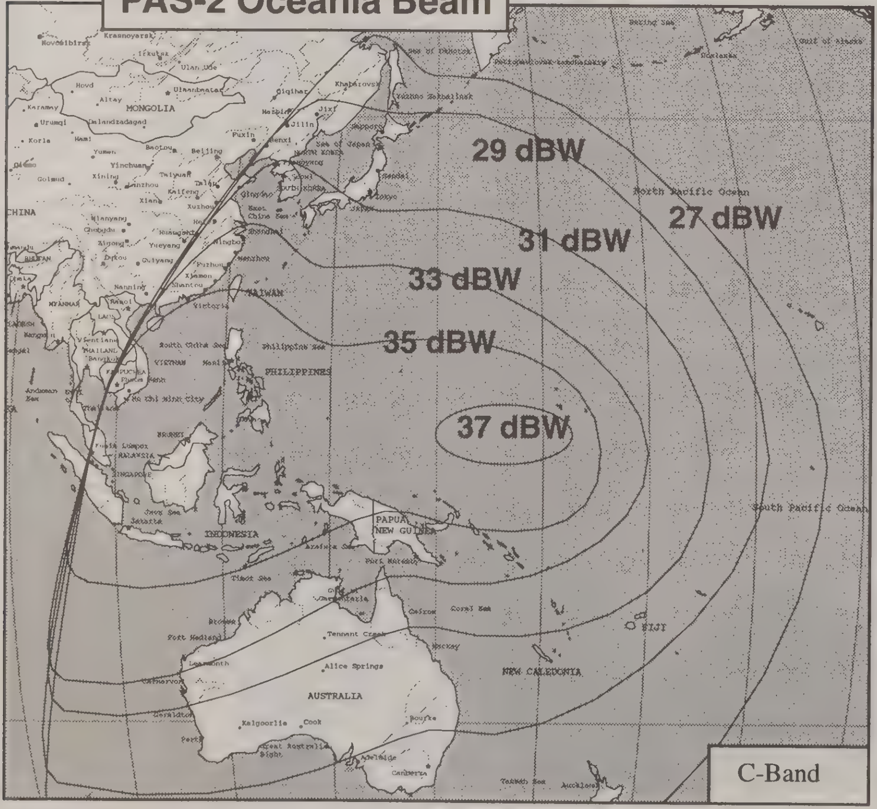
PAS-2 Asia-Pacific Beam



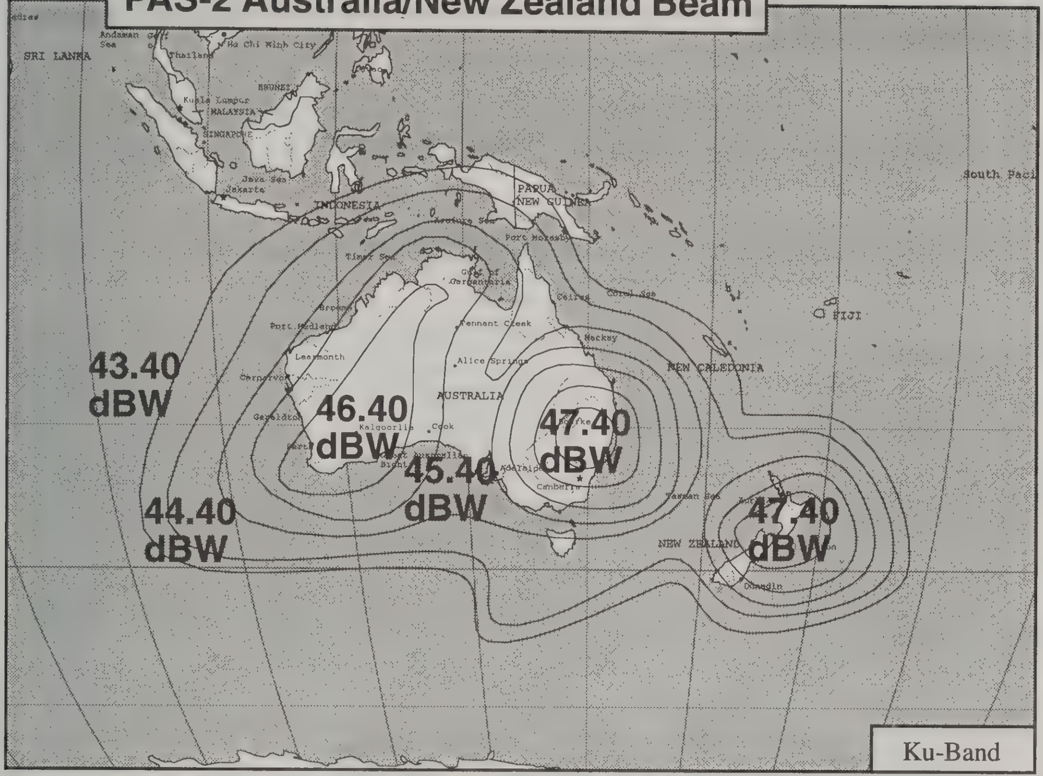
PAS-2 Northeast Asia Beam



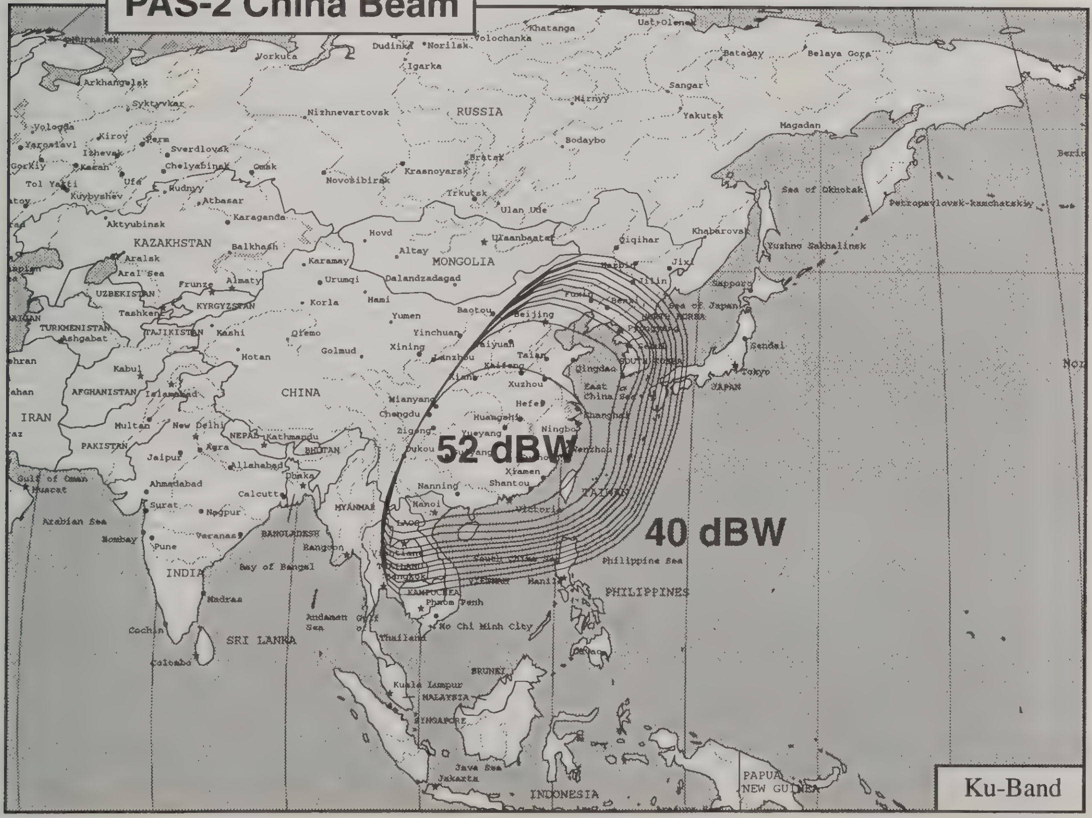
PAS-2 Oceania Beam



PAS-2 Australia/New Zealand Beam



PAS-2 China Beam



PAS-3 SYSTEM At A Glance

Satellite name: PAS-3, 317°E (43°W)

Spacecraft data:
- Stabilization: 3-axis
- Launch date: January 12, 1996
- Launch vehicle: Ariane 44L

Transponders:
- Number: 16 (C-band), 16 (Ku-band)
- Power output: 34 W SSPA (C-band), 63 W TWTA (Ku-band)
- Polarization: Linear
- G/T: +12 to -12 dB/K (C-band), +3 to -7 dB/K (Ku-band)
- EIRP: 27 to 41 dBW (C-band), 40 to 54 dBW (Ku-band)
- Frequency bands: C-band: Uplink (5.925-6.425 GHz), Downlink (3.700-4.200 GHz); Ku-band: Uplink (14.000-14.500 GHz), Downlink: (11.700-12.200 GHz and 12.500-12.750 GHz)

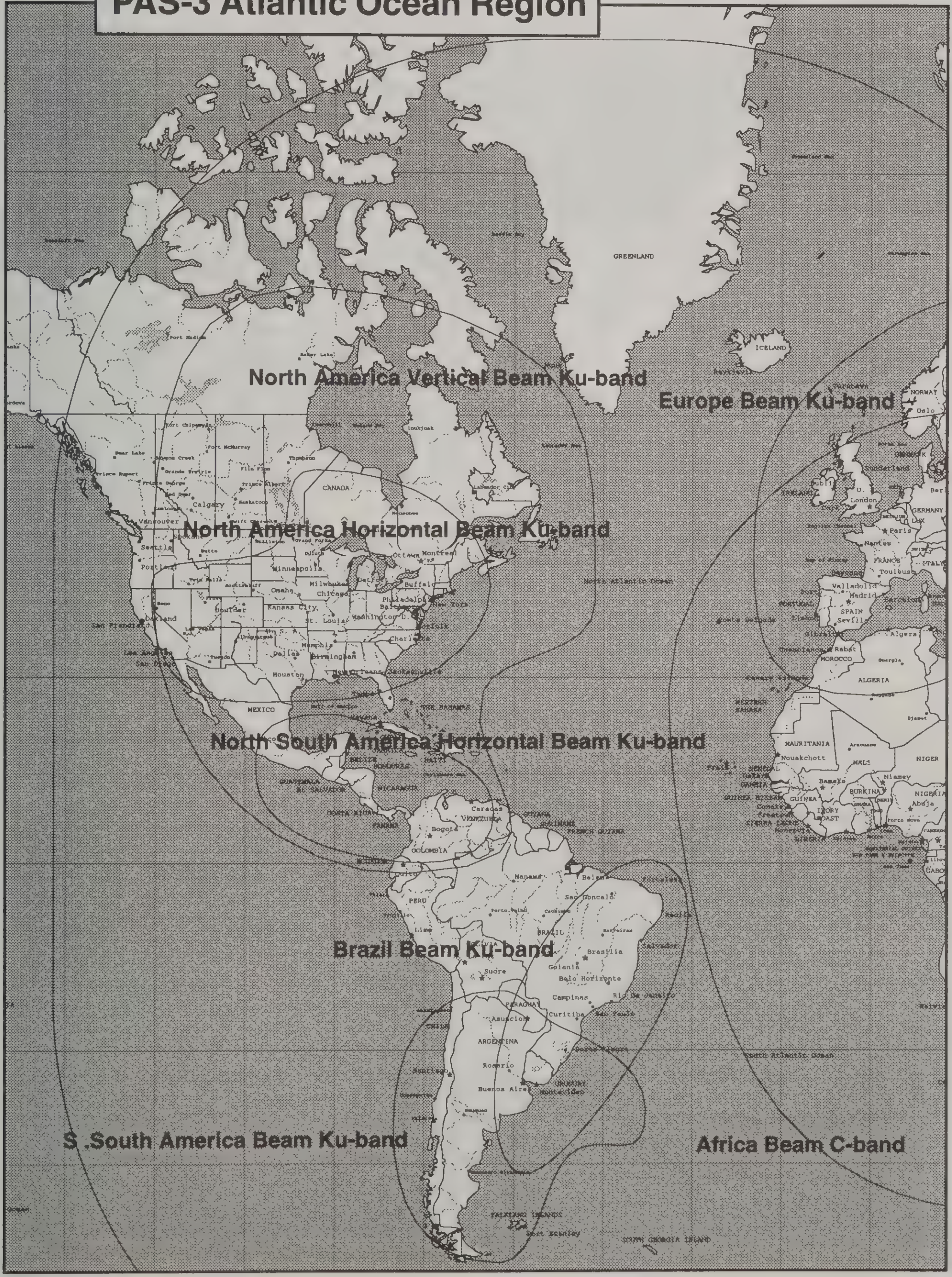
Single carrier saturation flux density: -96.0 dBW/m² (C-band), -89.0 dBW/m² (Ku-band)

Manufacturer: Hughes Space and Communications

PAS-3

Orbital location:	317°E (43°W)
Launch:	January 12, 1996, Ariane 44L

PAS-3 Atlantic Ocean Region


GREENLAND
ICELAND
North America Vertical Beam Ku-band
Europe Beam Ku-band
CANADA
North America Horizontal Beam Ku-band
North Atlantic Ocean
MEXICO
North South America Horizontal Beam Ku-band
Brazil Beam Ku-band
South Atlantic Ocean
S .South America Beam Ku-band
Africa Beam C-band

PAS-4 SYSTEM At A Glance

Satellite name: PAS-4, 68.5°E
Spacecraft data:
Mass (orbit): 1,727 kg
Launch date: August 3, 1995
Launch vehicle: Ariane 42L
Expected lifetime: 15 years
Beam configuration: Beam-shaped regional and spot beams

Transponders:
Number: 12 @ 54 MHz, 4 @ 64 MHz (C-band),
16 @ 27 MHz, 8 @ 54 MHz (Ku-band)
Power output: 30 W TWTA (C-band),
60 W TWTA (Ku-band)
Polarization: Linear
G/T: +2 to -12 dB/K (C-band),
+3 to -7 dB/K (Ku-band)
EIRP: 27 to 41 dBW (C-band),
40 to 55 dBW (Ku-band)
Frequency bands: C-band: Uplink (5.925-6.425 GHz),
Downlink (3.700-4.200 GHz);
Ku-band: Uplink (14.000-14.5000 GHz),
Downlink (11.450-11.700 GHz and
12.250-12.750 GHz)

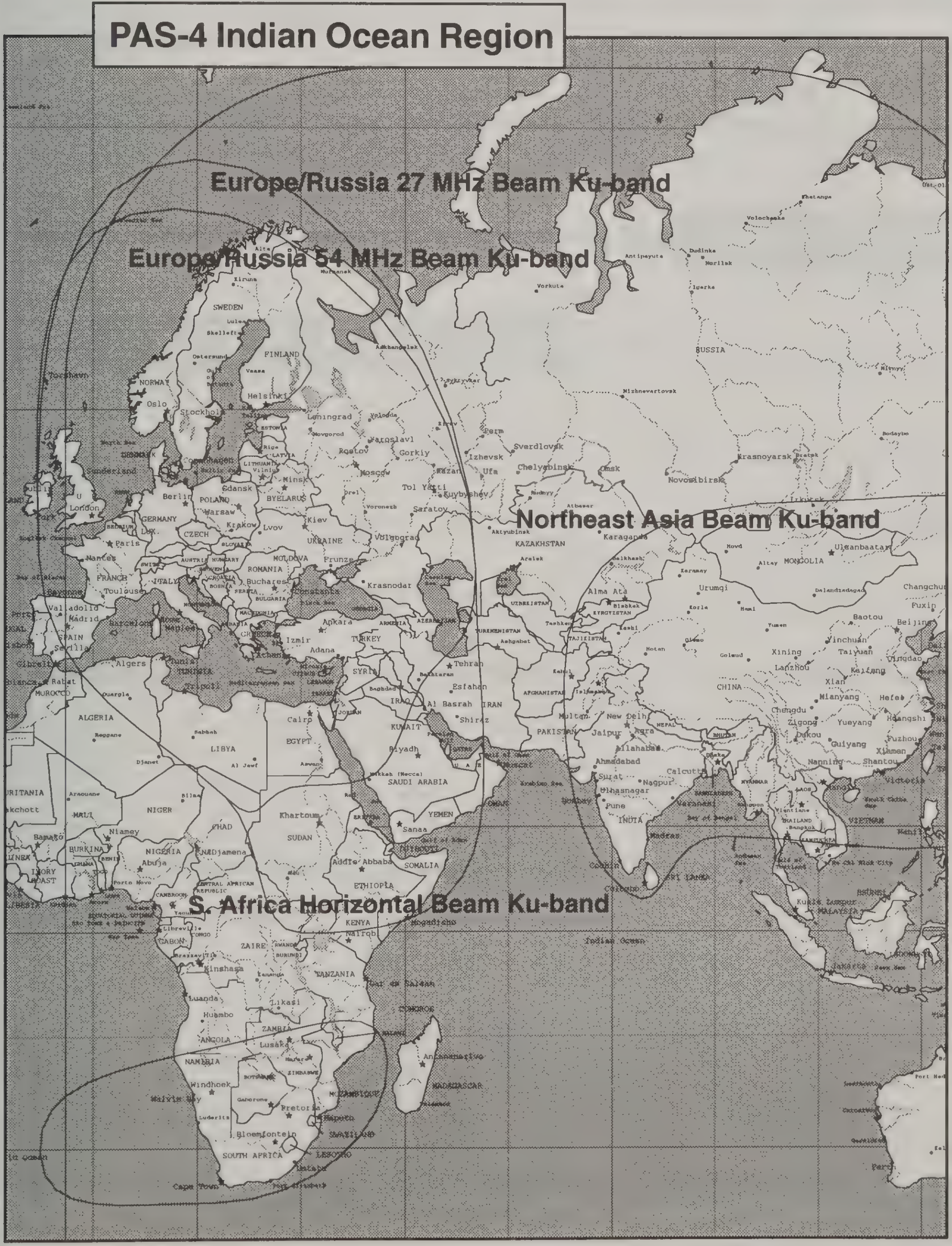
Single carrier saturation flux density: -96.0 dBW/m2 (C-band);
-86.0 dBW/m2 (54/64 MHz),
-89.0 dBW/m2 (27 MHz) [Ku-band]

Manufacturer: Hughes Space and Communications

PAS-4

Orbital location:	68.5°E
Launch:	August 3, 1995, Ariane 42L
Expected lifetime:	15 years
Expected end of life:	2010

PAS-4 Indian Ocean Region


Europe/Russia 27 MHz Beam Ku-band
Europe/Russia 54 MHz Beam Ku-band
Northeast Asia Beam Ku-band
S. Africa Horizontal Beam Ku-band

PAS-5 SYSTEM At A Glance

Satellite name: PAS-5, 302°E (58°W) [to be launched]
Spacecraft data:
- Launch date: May 1997
- Launch vehicle: Proton

- Transponders:
  - Number: 24 C-band, 24 Ku-band

- Manufacturer: Hughes Space and Communications

PAS-6 SYSTEM At A Glance

Satellite name: PAS-6, 317°E (43°W) [to be launched]
Spacecraft data:
- Launch date: April 1997
- Launch vehicle: Ariane 5

- Transponders:
  - Number: 36

- Manufacturer: Space Systems/Loral

PAS-7 SYSTEM At A Glance

Satellite name: PAS-7, 68.5°E* (to be launched)
Spacecraft data:
- Area of coverage: Europe, Asia and Africa
- Launch date: Late 1997
- Launch vehicle: Ariane 5

- Transponders:
  - Number: 44 C- and Ku-band
  - Power output: 3,700 W

- Manufacturer: Space Systems/Loral

*To be collocated with PAS-4

PAS-8 SYSTEM At A Glance

Satellite name: PAS-8, 166°E (to be launched)
Spacecraft data:
- Area of coverage: North America, Eastern Asia and Australia
- Launch date: Early 1998
- Launch vehicle: Proton

- Transponders:
  - Number: 48
  - Power output: 3,700 W

- Manufacturer: Space Systems/Loral

PLANNED INTERNATIONAL AND REGIONAL NETWORKS

ASIA BROADCASTING AND COMMUNICATIONS NETWORK PLC.

Bangkok THAILAND	Facsimile:	+66 2-271-0894

Contact:

Chet Chetsandthikhun, M Group

Overview:

Plans to launch LStar 1 in December 1997 and LStar 2 in June 1998.

Proposed Services:

- Ku-band broadcast services
- Direct-to-home television services

LSTAR SYSTEM At A Glance

Satellite name: .... LStar 1, 116°E; LStar 2, 116°E

Spacecraft data:

- Area of coverage: .... India, southeast Asia, China, and Taiwan
- Primary power (EOL): .... 3,600 W
- Launch date: .... December 1997 (1), June 1998 (2)
- Launch vehicle: .... Ariane 42P
- Expected lifetime: .... 14 years

Transponders:

- Number .... 32 Ku-band

Manufacturer: .... Space Systems/Loral

EUROPEAN SPACE AGENCY
(ESA)

8-10 Rue Mario Nikis
Paris Cedex 15 F-75738
FRANCE

Telephone:	+33 1-5369 7155
Facsimile:	+33 1-5369 7560
Web Site Address:	www.esrin.esa.it

Public Relations Contact:

Roger Elaerts, Head of Public Relations Division

Overview:

ESA's satellite Artemis will be ready for launch in mid-1998. Artemis is a multipayload satellite which will provide land mobile communications over Europe and a data relay service between LEO satellites and the ground. The land mobile payload will provide L-band coverage of Europe and adjacent regions (North Africa and Middle East) via one global beam and three spot beams. The communications capacity is approximately 900 voice channels at 4.8 kbps. Artemis will be positioned initially over Europe, between 6° and 19°E. Later it will be moved to 59°E to provide, with DRS-1 located at 316°E, an operational data relay service for ESA's polar platform mission, Envisat-1.

ESA is also considering the development of the Archimedes satellite. Archimedes is a satellite in an 8-hour highly inclined orbit intended to support high-quality digital audio broadcasting and advanced mobile communications in high latitude areas. The spacecraft is seen as the precursor to a multiregional system, composed of up to six satellites, providing uninterrupted coverage to three major service areas (Europe, Far East and a large part of North America) with elevation angles greater than 50°.

Proposed Services:

- Voice
- Data
- Digital audio broadcasting

ARTEMIS SYSTEM At A Glance

Satellite name:	Artemis, 16.4°E (initially)
Spacecraft data:	
Area of coverage:	Europe, North Africa and Middle East
Mass (at launch):	2,600 kg
Launch date:	mid-1998
Launch vehicle:	Ariane
Expected lifetime:	10 years

ARCHIMEDES SYSTEM At A Glance

Satellite name:	Archimedes
Spacecraft data:	
Area of coverage:	Europe, North America and the Northern Pacific basin
Launch date:	TBD

FRIENDLY ISLANDS SATELLITE COMMUNICATIONS LTD. (TONGASAT)

Corner Salote & Taufa'ahau Road
P.O. Box 2921
Nuku'alofa
TONGA

Telephone:	+676 24160
Facsimile:	+676 23322
Corporate E-mail:	tongasat@rpctel.dungeon.com
Web Site Address:	netstorage.com/kami/tongasat/index.htm

Contacts:

H.R.H. Princess Salote Pilolevu Tuita, Chairperson
Sione Kite, Managing Director
Lucy Anna Tupou, Marketing Officer
Meleane Ti'o Lavakei'aho, Corporate Secretary

Overview:

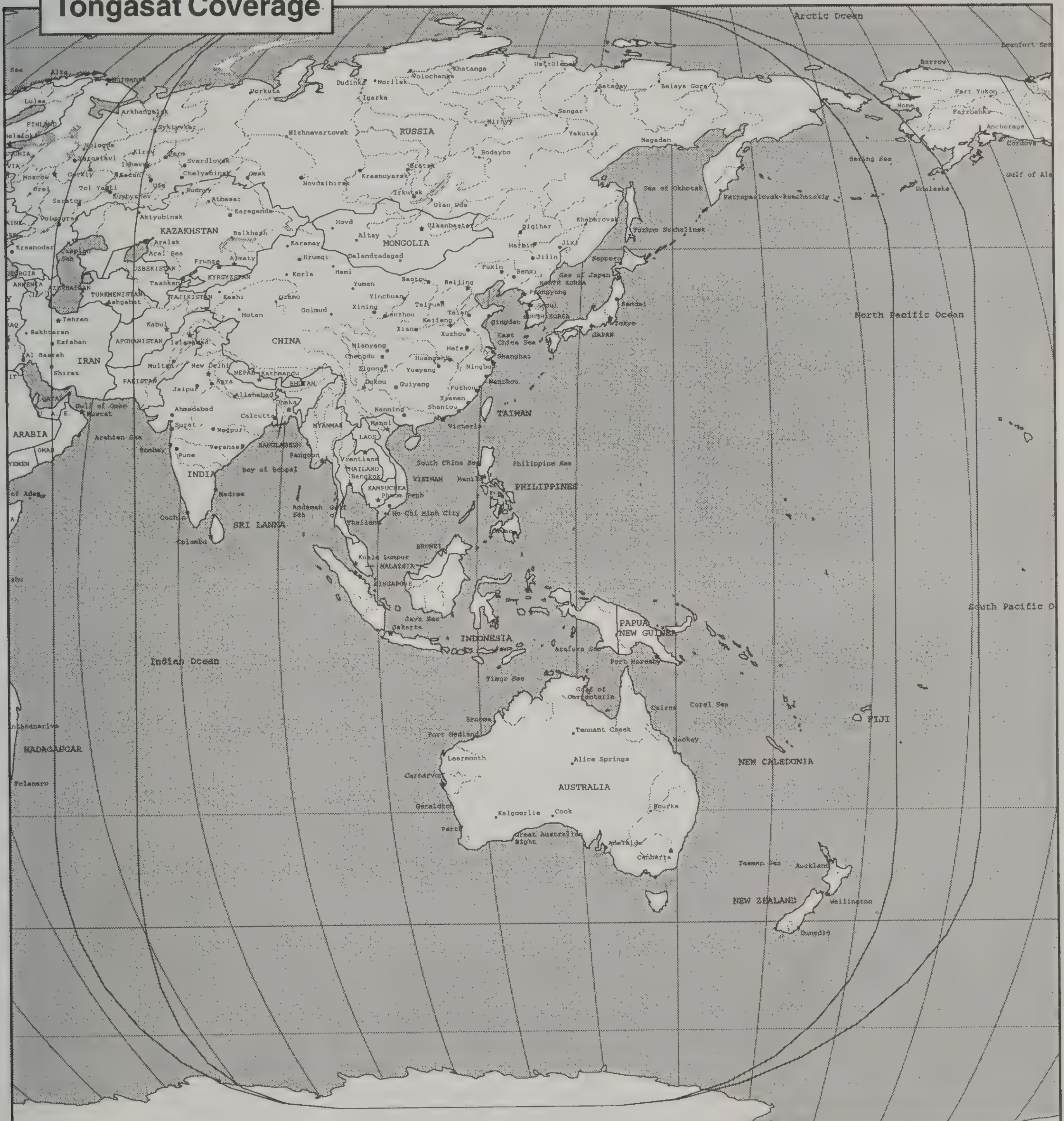
Tongasat is a privately owned registered company in the Kingdom of Tonga. The Kingdom of Tonga appointed Tongasat as the exclusive agent for the purpose of developing and utilizing C- and Ku-bands on the seven orbital slots -- 70°E, 83.3°E, 130°E, 134°E, 138°E, 142.5°E, and 170.75°E which the ITU granted priority to the Government of Tonga. At press time, three satellites were in operation.

These positions provide service within the Asia-Pacific region, and serve as ideal locations for transpacific links and links with Europe to the Asia-Pacific region.

Services Offered:

- Television
- Data
- Telephony

Tongasat Coverage



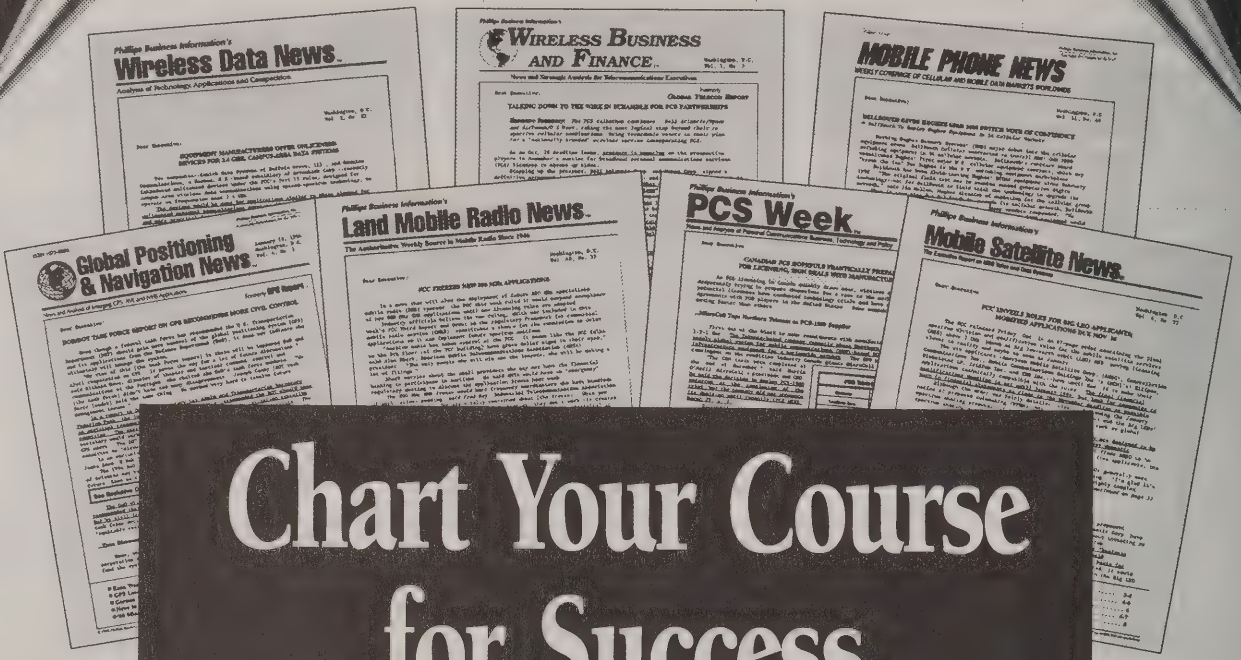
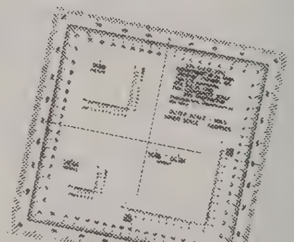


Chart Your Course for Success



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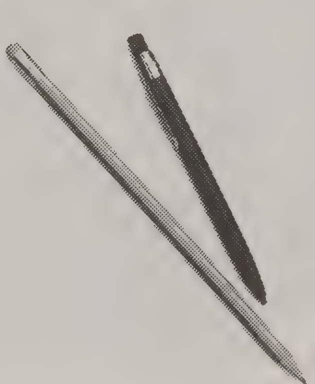
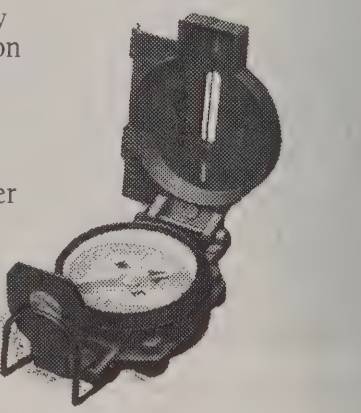
For the best actionable information on emerging wireless technology and to prosper in the years ahead, chart your course with Phillips Wireless Newsletters.





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SECTION 6

TRANSPONDER BROKERS & RESELLERS

Included in This Section:

This section contains an A-to-Z listing of companies that lease and/or sell transponder capacity. Included are transponder owners and lessors, as well as firms that procure satellite time on behalf of clients. A typical listing includes:

1. Company name, address, telephone and fax numbers, web site and e-mail address;
2. Year established, number of employees and geographic area served;
3. Revenue figures for 1995 and 1996;
4. Listing of key personnel;
5. Satellites on which transponder time is available and basis on which capacity can be obtained.

How to Use This Section:

This section is organized alphabetically by company name.

TRANSPONDER BROKERS & RESELLERS

ADVANCE ENTERTAINMENT CORPORATION
5015 Campuswood Drive
East Syracuse, NY 13057 USA
(315)432-9408; fax: (315)433-2342
■Year established: 1964; 18 employees; area served: North America; parent: Newhouse Broadcasting; ownership: private
■Karyn Howe, Director of Satellite Services; Betsy Bianco, Marketing Manager
■Brokers audio transponder capacity on Galaxy 1 and Satcom C4.

ADVANCED COMMUNICATIONS CORPORATION
6803 Cantrell Road, Suite 200
Little Rock, AR 72207 USA
(501)377-1493
■Daniel Garner, President
■Brokers time on the ACC system.

AIR FORCE SPACE COMMAND
2 SOPS/DOUAN
Falcon Air Force Base, CO 80912-3041 USA
(719)567-6378; fax: (719)567-6307; e-mail: gps@fafb.af.mil
■Brokers time on the Navstar system.

ALASCOM INC.
210 East Bluff Road
Anchorage, AK 99501-1100 USA
(907)264-7000; fax: (907)264-7027
■Year established: 1971; 700 employees; 1995 revenues: $100,000,000; area served: worldwide; parent: AT&T
■Charles E. Robinson, President; John R. Ayers, Executive Vice President and General Manager; R. Randal Ownbey, Vice President of Sales and Customer Service; Steve Fletcher, Supervisor of Anchorage Plant; Jeff Pearson, Sales Manager; Laurie Herman, Director of External Affairs
■Provides occasional-use and long-term capacity on the Aurora system.

AMERICAN MOBILE SATELLITE CORPORATION (AMSC)
10802 Parkridge Boulevard
Reston, VA 20191 USA
(703)758-6000; fax: (703)758-6111; web site: www.skycell.com; e-mail: info@skycell.com
■Year established: 1988; area served: USA, Puerto Rico, US Virgin Islands, coastal water; ownership: public
■Gary M. Parsons, President and Chief Executive Officer; Patrick Fitzpatrick, Vice President and Chief Financial Officer; Orly Konig-Lopez, Manager of Corporate Communications, e-mail: lopezo@skycell.com; Brian Pemberton, President of Skycell Services
■Brokers time on the AMSC system.

ANTRIX CORPORATION LIMITED
Antariksh Bhavan, New Bel Road
Bangalore, 560094 INDIA
+91 (0)803-34474; fax: +91 (0)803-34276
■Year established: 1992; 9 employees; 1995 revenues: $5,000,000; area served: worldwide; parent: Indian Department of Space; ownership: government
■K. Kasturirangan, Chairman; N. Sampath, Executive Director
■Brokers time on the Insat system.

APT SATELLITE COMPANY LTD.
Room 3111-3112, 31/F, One Pacific Place
Queensway, HONG KONG
+852 (2)526-2281; fax: +852 (2)522-0419; e-mail: aptscc@hongkongstar.com
■Chen Ji Bin, Vice President; Yang Xie-Ming, Director of Marketing Department; Zhang Ke-Ping, Director of Marketing Department
■Brokers time on the Apstar system.

ARABSAT (ARAB SATELLITE COMMUNICATIONS ORGANIZATION)
P.O. Box 1038
Riyadh, 11431 SAUDI ARABIA
+966 1-4646-666; fax: +966 1-4656-983; web site: www.arabsat.com; e-mail: arabsat@arab.net
■Year established: 1976; 105 employees; area served: Arab countries
■Saad bin Abdul-Aziz al Bidna, Director General, e-mail: arbsat%sakacsoo.bitnet@vtbit.cc.vt.edu; Nabil A. Shanti, Director of Operations and Marketing
■Brokers time on the Arabsat system.

ASIA SATELLITE TELECOMMUNICATIONS COMPANY LTD. (ASIASAT)
23-24/F East Exchange Tower, 38-40 Leighton Road
Causeway Bay, HONG KONG
+852 (2)805-6666; fax: +852 (2)504-3875
■Year established: 1988; 55 employees; 1995 revenues: HK$326,620,000; 1996 projected revenues: HK$755,000,000; area served: Asia, Middle East, Australasia, CIS; parent: Asia Satellite Telecommunications Holdings Ltd.
■Peter Jackson, Chief Executive Officer; Sabrina Cubbon, General Manager of Marketing; Winnie Pang, Corporate Affairs Manager
■Brokers time on the AsiaSat system.

ATLANTIC SATELLITE COMMUNICATIONS INC.
240 Pegasus Avenue
Northvale, NJ 07647 USA
(201)784-0555; fax: (201)767-0781
■Donald Buck, President; Mark Lowden, Account Executive; Joe Garzillo, Account Executive
■Brokers time on PAS-1, Telstar 401 and Telstar 402R.

AUTOTOTE COMMUNICATION SERVICES INC.
444 Madison Avenue, Suite 3101
New York, NY 10022 USA
(212)753-6024; fax: (212)826-9136
■Year established: 1961; 100 employees; area served: USA; parent: Autotote Corporation; ownership: public
■Mark E. Sillcox, President; Kevin Mulhare, Marketing Coordinator; Emilie Munda, Director of Operations; Anthony Verzella, Ad-hoc Sales
■Brokers time on Galaxy VI, Telstar 401 and Telstar 402R.

BAF COMMUNICATION LTD.
Widney House, Bromsgrove Road
Redditch, Warwickshire B97 4SP UNITED KINGDOM
+44 1527-597-850; fax: +44 1527-597-855
■Year established: 1983; 1995 revenues: $22,000,000; area served: worldwide; ownership: private
■Ian Dawson, Director of European Sales and Engineering; Charles Angelakis, President; Angel Angelakis, Chief Financial Officer
■Brokers C- and Ku-band satellite time on all commercially available satellites.

BAF COMMUNICATIONS CORPORATION
314-316 Northstar Court
Sanford, FL 32771 USA
(407)324-8250; (800)633-8223; fax: (407)324-7860; web site: www.bafcom.com; e-mail: baf@gate.net
■Year established: 1983; 20 employees; 1995 revenues: $25,000,000; 1996 projected revenues: $28,000,000; area served: worldwide; ownership: private
■Charles G. Angelakis, President and Chief Executive Officer; Robert C. King, Vice President of Sales and Marketing; James R. Vautrot, Vice President and General Manager of Broadcast Services; Ian Dawson, Managing Director of BAF Ltd., U.K.; Bob Denison, Vice President of Engineering; Angel Angelakis, Chief Financial Officer; Mitch Farris, Western Regional Sales Manager
■Brokers C- and Ku-band satellite time on all commercially available satellites.

BAF COMMUNICATIONS CORPORATION — EUROPEAN SALES AND SERVICES ERNATEC
Leuvonse Steenweg 573-7-B
Zaventem, B-1930 BELGIUM
+32 27-252-215; fax: +32 27-202-435
■Year established: 1984; 20 employees
■Luc Thys
■Brokers C- and Ku-band satellite time on all commercially available satellites.

BINARIANG SATELLITE SYSTEMS SDN BHD
8th Floor Block B, Wisma Semantan, No. 12 Jalari Gelenggang, Bukit Damansara
Kuala Lumpur, 50490 MALAYSIA
+60 (3)380-7000; fax: +60 (3)380-7018
■Agnes Yeow, Senior Executive; Tengru Alina Ibrahim, Senior Manager of Corporate Communications; Abdul Halim, Senior Manager of Measat Commercial Operations
■Brokers time on the Measat system.

B&P THE SPACECONNECTION INC.
10530 Victory Boulevard
North Hollywood, CA 91606 USA
(818)754-1100; fax: (818)754-1112
■Year established: 1987; 8 employees; area served: worldwide; ownership: private
■Robert M. Patterson, President; Priscilla L. Davis, Executive Vice President; Suzie Kotani, Manager of Satellite Services; Marilyn Huecas, Accounting Supervisor; Steve Wagner, Coordinator of Satellite Services
■Reseller of long-term, short-term and occasional-use transponder time on Galaxy 4, 6 and 7; SBS 5 and 6; Panamsat; and Telstar 401. Leases five full-time transponders on Galaxy 3R, five full-time transponders on Telstar 402R, one full-time transponder on SBS6, Galaxy VI, Galaxy IV, and Satcom C1, in addition to bulk-buy arrangements with all major satellite carriers for C-band and Ku-band satellite time.

BROADCAST SATELLITE INTERNATIONAL INC.
5068 Plano Parkway, Suite 113
Plano, TX 75093 USA
(972)250-1100; fax: (972)248-9853; web site: www.strategies.net/bsi
■Year established: 1986; 10 employees; 1995 revenues: $20,000,000; area served: worldwide; ownership: private
■Timothy J. Flynn, President, e-mail: tflynn@strategies.net; Rick Creel, Executive Vice President and General Manager, e-mail: rcreel@strategies.net; Britt Smith, Controller, e-mail: bsmith@strategies.net; Belinda Reyna, Director of Satellite Services, e-mail: breyna@strategies.net; Lorena Arguijo, Administrative Assistant, e-mail: larguijo@strategies.net; Kecia Beam, Uplink and Project Assistant, e-mail: kbeam@strategies.net
■Brokers long-term, short-term and occasional-use capacity on all domestic satellites.

C2C SATELLITE PRODUCTIONS INC.

Suite 2, 2616 - 16 Street NE
Calgary, AB T2E 7J8 CANADA
(403)291-1630; fax: (403)291-7026

■Year established: 1988; 3 employees; 1995 revenues: $1,000,000; 1996 projected revenues: $1,200,000; area served: western Canada and northwestern USA; parent: Starlink Communications; ownership: private

■Jim Ellis, General Manager; Dwane Williams, Vice President; Chris Simon, Uplink Operator and Technical Supervisor; Henry Van Der Sloot, President; David Richards, Chief Financial Officer

CANADIAN SATELLITE COMMUNICATIONS INC.

50 Burnhamthorpe Road West, 10th Floor
Mississauga, ON L5B 3C2 CANADA
(416)272-4960; fax: (416)272-3399

■Year established: 1981; 138 employees; area served: Canada and North America; parent: Western International Communications Inc.; ownership: public

■Alain Gourd, President and Chief Executive Officer; Colley Clark, Vice President of Finance, Administration and Human Resources; Diane Medley, Director of Marketing for Cable Services; L. Corke, Vice President of Cable Services; T. Pirner, Vice President of Business Services; John Underhill, Vice President of Network Operations; Louise Tremblay, Chief Operating Officer; Claude Lewis, Executive Vice President

■Leases eight full-time C-band transponders and two occasional-use Ku-band transponders. Provides satellite-to-cable services, vehicle tracking and messaging service and shared access to VSAT business television services. Accesses Anik E1 and E2.

CBS INC.

524 West 57th Street, 1st Floor
New York, NY 10019 USA
(212)975-5277; fax: (212)975-1748
Area served: worldwide

■Brent Stranathan, Vice President of Broadcast Distribution, e-mail: blstranathan@cbs.com; Christine Ehrenbard, Director of Broadcast Distribution; Richard McNulty, Director of Network Operations

■Leases transponder time on Galaxy IV and VII. Broadcasts network programming.

CENTREX COMMUNICATIONS CORPORATION

Demerest House, 28 Railroad Avenue
Warwick, NY 10990 USA
(914)987-1666; fax: (914)987-1410; e-mail: centrex@warwick.net

■Year established: 1985; 9 employees; area served: USA, Caribbean and Europe; ownership: private

■Leslie G. H. Pride Collins, President and Chief Operating Officer, e-mail: centrex@warwick.net; Patrick C. Maloy, Vice President of Operations, e-mail: centrex@warwick.net

■Brokers long-term and short-term satellite capacity on all domestic U.S. and international satellites.

CENTURY III AT UNIVERSAL STUDIOS

2000 Universal Studios Plaza
Orlando, FL 32819-7606 USA
(407)354-1000; fax: (407)352-8662

■Year established: 1989; 50 employees; area served: Florida; ownership: private

■Ross Cibella, President; Jim Dorriety, Vice President of Sales and Marketing; David Wilson, Vice President of Engineering; John Dussling, Vice President and General Manager

■Accesses the Anik, Galaxy and Spacenet systems, Satcom C1, Satcom C3, Satcom C4, Satcom C5, Telstar 302, Telstar 303, and Telstar 401.

COLUMBIA COMMUNICATIONS CORPORATION

7200 Wisconsin Avenue, Suite 701
Bethesda, MD 20814 USA
(301)907-8800; (888)907-8800; fax: (301)907-2420; web site: tdrss.com; e-mail: columbia@tdrss.com

■Year established: 1983; 10 employees

CONUS

TOTAL SATELLITE SERVICE

- Satellite Time
- Mobile Transmission
- Teleconferencing
- Video Production
- 24-Hour TOC
- Great Rates!

Contact: Michelle Patraw (612) 642-4641
3415 University Ave., Minneapolis/St. Paul, 55414

Circle 238 on reader service card

■Ken Gross, Chief Operating Officer and General Counsel, e-mail: kgross@tdrss.com; Blair Marshall, Satellite Sales Executive; George Alatsatianos, Vice President of Engineering, e-mail: galatsatianos@tdrss.com; Ray Sweeney, Corporate Communications, (808)523-8100

■Brokers long-term, short-term and occasional-use on TDRSS-AOR and TDRSS-POR.

COMSAT CORPORATION

6560 Rock Spring Drive
Bethesda, MD 20817 USA
(301)214-3000; fax: (301)214-7100; web site: www.ctd.comsat.com

■Year established: 1963; 2,770 employees; 1995 revenues: $754,000,000; area served: worldwide; ownership: public

■Melvin R. Laird, Chairman; Bruce L. Crockett, President and Chief Executive Officer; C. Thomas Faulders, III, Vice President and Chief Financial Officer; Steven F. Bell, Vice President of Human Resources and Organization Development; Ronald J. Mario, President of Comsat Mobile Communications; Betty C. Alewine, President of Comsat World Systems; Charlie Lyons, President of Comsat Video Enterprises; Richard E. Thomas, President of Comsat RSI; John V. Evans, President of Comsat Laboratories; Allen E. Flower, Controller; Wesley D. Minami, Treasurer; Arthur Sando, Vice President of Corporate Affairs; Warren Y. Zeger, Vice President and General Counsel; Walter S. McKee, Sr., Director of Satellite Control Center, (301)428-2000; Elizabeth McLean, Director of Corporate Communications

■Brokers time on the SBS and Comstar systems.

CONUS COMMUNICATIONS INC.

**3415 University Avenue
Minneapolis, MN 55414 USA
(612)642-4645; fax: (612)642-4680; web site: www.conusnews.com**

■Year established: 1985; 180 employees; area served: worldwide; parent: Hubbard Broadcasting; ownership: private

■Charles H. Dutcher, III, President and General Manager; Denise Hungerford, Marketing Coordinator; Woody Hubbell, Video and Satellite Services Manager; Brian Tuttle, Project Manager; Jim De Bellis, Traffic Manager; Michelle Patraw, Account Executive; Mark Angelini, Director of Marketing and Business Development, Conus Washington; Ray Conover, Vice President of Engineering

■Brokers long-term, short-term and occasional-use transponder time on all satellites, particularly SBS6.

CRAWFORD SATELLITE SERVICES

535 Plasamour Drive
Atlanta, GA 30324 USA
(770)876-7149; fax: (770)876-8956

■Year established: 1985; 200 employees; area served: worldwide; parent: Crawford Communications; ownership: private

■Jessie Crawford, President; James Schuster, Vice President

■Brokers long-term and occasional-use capacity on all satellites, primarily domestic.

CSC MANAGEMENT INC.

28 West Grand Avenue, P.O. Box 547
Montvale, NJ 07645 USA
(201)930-0533; fax: (201)930-1013

■Year established: 1989; 25 employees; 1995 revenues: $3,000,000; area served: worldwide; ownership: private

■Charles E. Sackermann, Jr., President; Vernice Sackermann Miller, Secretary, Treasurer and Chief Financial Officer; Kathy Sackermann McGovern, Vice President of Administration

■Brokers short-term capacity and occasional-use capacity on both domestic and international satellites.

CYCLE SAT INC.

119 John K. Hanson Drive
Forest City, IA 50436 USA
(515)582-6999; fax: (515)582-6998; web site: www.cyclesat.com

■Year established: 1986; 220 employees; area served: USA; parent: Winnebago Industries; ownership: private

■Loren Swenson, President and Chief Executive Officer; Pete Kenne, Director of Operations; Tom Mikkelsen, Vice President and Chief Technology Officer

■Brokers long-term and occasional-use capacity on Satcom K2, transponder 4.

DALLAS FORT WORTH TELEPORT LTD.

3838 Leone Drive
Irving, TX 75039 USA
(214)869-1800; fax: (214)869-2302; web site: www.dfwteleport.com

■Year established: 1984; 16 employees; area served: worldwide; ownership: private

■ Dean G. Popps, President, e-mail: dpopps@dfwteleport.com; John Hatem, Vice President and General Manager, e-mail: jhatem@dfwteleport.com; Raymond Jones, Director of Operations and Engineering, e-mail: rjones@dfwteleport.com; Valerie Larson, Director of Business Development, e-mail: vlarson@dfwteleport.com

■Brokers transponder capacity on satellites in the U.S. domestic arc including Morelos, Solidaridad, Orion, TDRSS, Panamsat 1 (European beam), PAS 3R, and Anik.

DEUTSCHE TELEKOM AG
Headquarters, P.B. 2000
Bonn, D-53105 GERMANY
+49 2281-810; fax: +49 2281-818-872; e-mail: info@nic.dtag.de
■Axel Jorns, Director of Satellite Systems; Mr. Bocking
■Brokers time on the DFS-Kopernikus and TV-SAT systems.

DIRECTSAT CORPORATION
c/o SSE Telecom Inc., 47823 Westinghouse Drive
Fremont, CA 94539 USA
(510)657-7552; fax: (510)490-8501
■Year established: 1988; 250 employees; area served: worldwide
■Fred C. Toombs, President; Daniel Moore, Executive Vice President and Chief Financial Officer
■Brokers time on the Directsat system.

DIRECTV INC. — A UNIT OF HUGHES ELECTRONICS CORPORATION
2230 East Imperial Highway
El Segundo, CA 90245 USA
(310)535-5113; fax: (310)535-5225; web site: www.directv.com
■Eddy W. Hartenstein, President; James B. Ramo, Executive Vice President; L. William Butterworth, Executive Vice President; Thomas M. Bracken, Vice President of Communications; Stephen Ste. Marie, Vice President of Sales and Marketing
■Brokers time on the DirecTV system.

DIVERSIFIED COMMUNICATIONS INC. (DCI)
2030 M Street NW, Suite 206
Washington, DC 20036 USA
(202)775-4300; (800)333-0010; fax: (202)775-4363; web site: www.dciteleport.com
■Year established: 1987; 17 employees; area served: worldwide; ownership: private
■Alan C. Levin, President, e-mail: levin@dciteleport.com; Nelson Crumling, Vice President, e-mail: crumling@dciteleport.com; Margaret Dickens, Operations, e-mail: dickens@dciteleport.com; Jim Grahne, Vice President and General Manager, e-mail: grahne@dciteleport.com; Greg Viggiano, Director of Sales and Marketing, e-mail: viggiano@dciteleport.com
■Brokers occasional-use transponder capacity.

ECHOSTAR COMMUNICATIONS CORPORATION
90 Inverness Circle East, P.O. Box 6552
Englewood, CO 80155 USA
(303)799-8222; fax: (303)799-6222; web site: www.echostar.com
■Bill Vanderpoel, Vice President of New Business; Tom Kaser, Media Relations Specialist
■Brokers time on the EchoStar system.

EDUCATIONAL TELEVISION SERVICES
Telecommunications Center, Oklahoma State University
Stillwater, OK 74078 USA
(405)744-5960; fax: (405)744-8563
■Year established: 1960; 40 employees; area served: USA; ownership: private
■Marshall E. Allen, Director; Tim Cushing, Assistant Director of Operations and Satellite Services; Roger Bolton, Assistant Director of Creative Services
■Brokers long-term, short-term and occasional-use capacity on Galaxy 6; Spacenet 1, 2, 3, and 4; GStar 1, 2 and 4; and all SBS satellites. Brokers C- and Ku-band transponders.

EFC STARTIME
12539 Allin Street
Los Angeles, CA 90066 USA
(310)823-6447; fax: (310)823-0637
■Year established: 1977; 5 employees; area served: worldwide; parent: Startime Communications
■Grace E. Leone, President, e-mail: gleone@earthlink.net
■Brokers long-term and occasional-use capacity on Galaxy 2, 4, 6, and 7; Spacenet 1, 3 and 4; Telstar 302 and 303; Satcom; SBS 4, 5 and 6; and GStar 1, 2 and 4. Arranges transponder sales. Provides access to all U.S. domestic and international satellites, including Intelsat and Panamsat.

EMPRESA BRASILEIRA DE TELECOMUNICACOES (EMBRATEL)
Telecommunications Services Directory (Brasilsat),
Avenida Presidente Vargas, 1012, 15th Floor
Centro - Rio de Janeiro, 20179-900 BRAZIL
+55 (21)5197444/+55 (21)5197461; fax: +55 (21)2530796; web site: www.embratel.net.br/institucional/main.html
■Edson Soffiatti, International Director; Luiz Carlos Ferreira de Mattos, Head of Satellite Transmission Department; Luiz Francisco Tenorio Perrone, Telecommunications Services Director; Carlos Altino Paiva, Head of the Services Management Department
■Brokers time on the Brazilsat system.

EUROPEAN SPACE AGENCY (ESA)
8-10 Rue Mario Nikis
Paris Cedex 15, F-75738 FRANCE
+33 (1)5369-7155; fax: +33 (1)5369-7560; web site: www.esrin.esa.it
■Year established: 1975; 2,050 employees; ownership: government
■Roger Elaerts, Head of Public Relations Division; Jean-Marie Luton, Director General
■Brokers time on the Olympus system.

EUTELSAT (EUROPEAN TELECOMMUNICATIONS SATELLITE ORGANIZATION)
Tour Maine-Montparnasse, 33 avenue du Maine
Paris Cedex 15, F-75755 FRANCE
+33 (1)4538-4747; fax: +33 (1)4538-3700; web site: www.eutelsat.org
■Vanessa O'Connor, Press and Relations Manager, +33 (1)4538-4757; Jean Srenier, Director General; Givliano Berretta, Commercial Director; Dg Hardman, Finance Director; Andreas Langemeyer, Technical Director; Jesus Domingo Laborda, Operations Director
■Brokers time on the Eutelsat system.

FIFTH DIMENSION COMMUNICATIONS CORPORATION
2500 Don Reid Drive
Ottawa, ON K1H 1E1 CANADA
(613)737-7333; (800)565-1471; (800)267-1221; fax: (613)737-4026
■Year established: 1992; 140 employees; area served: worldwide; ownership: private
■Stuart K. Duncan, President, e-mail: sduncan@5d.com; Jennifer Racine, General Sales Manager, e-mail: jracine@5d.com; Grahame Fournier, Director of Engineering, e-mail: gfournier@5d.com
■Brokers time on the Anik and Telstar systems. Brokers time on Galaxy IIIR, IV, VI, and VII; SBS5 and SBS6; Telstar 302, 401 and 402; GE-1; and Nahuelsat.

FLORIDA PUBLIC BROADCASTING SERVICE INC.
P.O. Box 10910
Tallahassee, FL 32302-2910 USA
(904)414-9990; fax: (904)414-9998
■Year established: 1977; 25 employees; 1995 revenues: $1,200,000; area served: Florida; ownership: private
■John M. Thomas, Executive Producer; James D. Moran, Executive Director; Richard Potrikus, Operations Manager; Bobby G. Sims, Chief Engineer
■Brokers time on Telstar 401.

FRANCE TELECOM
6 place d'Alleray
Paris Cedex 15, F-75740 FRANCE
+33 (1)4444-2222; fax: +33 (1)4657-9511; web site: www.francetelecom.com/ft/fthome.htm
■Kimberly Steiner, USA Contact, (212)977-8630
■Brokers time on the Telecom system.

GE AMERICAN COMMUNICATIONS
Four Research Way
Princeton, NJ 08540-6684 USA
(609)987-4000; fax: (609)987-4517
■Year established: 1975; 500 employees; parent: General Electric Corporation; ownership: public
■John F. Connelly, Chairman and Chief Executive Officer; John C. DiMarco, Chief Financial Officer; Andreas M. Georghiou, Vice President of Satellite Services; William Lynch, Director of Purchasing; Gerald Kaplan, Technical Representative; George Monaster, Vice President of International Marketing
■Brokers occasional-use and long-term capacity and arranges transponder sales on the Satcom satellite system.

GE STARSYS
1750 Old Meadow Drive, Suite 6025
McLean, VA 22102 USA
(703)848-1224; fax: (703)848-1058; e-mail: americom.arenshaw@capital.ge.com
■Year established: 1990; 4 employees; area served: worldwide; parent: GE Capital Services; ownership: private
■Yousef Javadi, President; Alan Renshaw, Manager of Government Affairs; Nick Ignatovicz, Manager of Business Analysis
■Brokers time on the Starsys system.

GROUP W NETWORK SERVICES
250 Harbor Drive, P.O. Box 10210
Stamford, CT 06904 USA
(203)965-6000; fax: (203)965-6320
■Year established: 1980; area served: worldwide; parent: Westinghouse Broadcasting Company Inc.; ownership: public
■Altan Stalker, Senior Vice President and General Manager; Lou DiMauro, Manager of Video Sales; Peter Concelmo, Vice President of Sales and Marketing; Meg Hogan, Marketing Specialist
■Brokers full-time and occasional-use transponder capacity on all U.S. domestic and international C-band and Ku-band satellites.

GUNNER COMMUNICATIONS INC.
4794 Annistown Road
Stone Mountain, GA 30087 USA
(404)634-1288; (800)792-1201; fax: (800)217-3795
Area served: worldwide; ownership: private
■Rick Russell, President; O. Ethridge, Chief Executive Officer; Susan Kuzemchak, Event Coordinator
■Accesses all domestic, Panamsat and Intelsat satellites. Provides mobile and fixed C- and Ku-band uplinking, downlinking, special events, disaster recovery, news feeds, sports, production, post-production, videoconferencing, studio facilities, and encryption.

GUYCOM/TEXAS WORLD TELEPORT
1005 Congress, Suite 460
Austin, TX 78701 USA
(512)472-6862; fax: (512)322-0790; web site: www.guycom.com
■Year established: 1985; 3 employees; 1995 revenues: $750,000; 1996 projected revenues: $850,000; area served: USA; ownership: private
■Ray Guy, Chief Executive Officer; Terri Guy, President
■Brokers long-term capacity on ASC 1, transponder 24 and GStar 4.

HERO PRODUCTIONS
7291 NW 74th Street
Miami, FL 33166 USA
(305)887-5900; fax: (305)887-7076; web site: www.heroprod.com
■Year established: 1992; 60 employees; ownership: private
■Robert Behar, President; Daniel Sawicki, Vice President; David Sprechman, Chief Financial Officer; Charles Trice, Director of Engineering; Rick Behar, Broadcast Facilities Manager; Emiliano Calemzuk, Account Executive

HIRED GUN MICROWAVE COMMUNICATIONS INC.

129 Jackson Mills Road
Freehold, NJ 07728 USA
(908)303-0464; fax: (908)303-0466
■Year established: 1985; 6 employees; area served: east coast USA
■Brian W. Loy, President
■Brokers short-term and occasional-use capacity.

HISPASAT S.A.

Cable Gobelas 41-43, La Florida
Madrid, E-28080 SPAIN
+34 (1)372 9000; fax: +34 (1)372 8941
■Year established: 1989; 85 employees; 1995 revenues: $80,000,000; 1996 projected revenues: $90,000,000; area served: Europe and USA
■Pascual Menendez, Exploitation Director; Jose MaCasas, Commercial Subdirector; Julian Sesena, Technical Manager; Jose M. Vazquez Quintana, President; Jose Diaz, Director of External Relations; Damian Gomez, Head Booking Office
■Brokers time on the Hispasat system.

HOLMDEL INTERNATIONAL OPERATIONS CENTER — A SERVICE OF MTN-MARITIME TELECOMMUNICATIONS NETWORK

389 Passaic Avenue, Suite 201
Fairfield, NJ 07004 USA
(201)882-4185; fax: (201)575-1191
■Year established: 1981; 35 employees; 1995 revenues: $15,000,000; area served: worldwide; parent: ICG Satellite Services; ownership: public
■Douglas I. Falk, President; Robert Hanson, Vice President of Engineering; Thomas Hayes, Vice President of Operations; William LaShell, Vice President of Government Operations
■Brokers long-term, short-term and occasional-use capacity time on all U.S. domestic and international satellites.

HUGHES COMMUNICATIONS INC.

P.O. Box 9712
Long Beach, CA 90810 USA
(310)525-5211; fax: (310)525-5220; web site: www.hcisat.com
■Year established: 1979; 400 employees; 1995 revenues: $386,000,000; area served: USA and Latin America; parent: Hughes Electronics; ownership: public
■Jerry Farrell, President of Hughes Communications Inc.; Wendy Greene, Manager of Public Relations, e-mail: wagreene@ccgate.hac.com
■Seven Galaxy satellites are used for cable broadcast and syndication television distribution, single channel per carrier radio distribution and international television service. Three SBS satellites are used for broadcast television distribution, business television, distance learning, and satellite newsgathering.

IN SYNC UPLINK

2526 South Tracy Drive
Erie, PA 16505 USA
(814)838-6217; fax: (814)833-6098
■Year established: 1991; 3 employees; area served: Midwest to Atlantic states; ownership: private
■Mitch Spear, President, e-mail: mspear@worldnet.att.net

INDIAN DEPARTMENT OF SPACE

Antariksh Bhavan, New BEL Road
Bangalore, 560094 INDIA
+91 (8)033-34474; fax: +91 (8)033-32292
■S. V. Kibe, Deputy Director of Insat Programme Office; L. S. Satyamurthy, Counsellor, +1(202)939-9811, fax: +1 (202)939-9870
■Brokers time on the Insat system.

INMARSAT (INTERNATIONAL MOBILE SATELLITE ORGANIZATION)

99 City Road
London, EC1Y 1AX UNITED KINGDOM
+44 171-728-1000; fax: +44 171-728-1044; web site: www.worldserver.pipex.com/inmarsat/index.htm
■Elizabeth Hess, Head of Press Relations; Caroline Chalumeau, Director of Corporate Communications; Gavin Trevitt, Business Communications Manager
■Brokers time on the Inmarsat system.

INTELCOM GROUP INC.

9174 South Jamaica Street
Englewood, CO 80112 USA
(303)397-4100; fax: (303)799-8325
■Year established: 1986; 500 employees; area served: worldwide; ownership: public
■Bill Becker, Chairman; John Evans, Chief Financial Officer; Bill Maxwell, President; Claire Murray, Sales Support
■Brokers full-time and occasional-use capacity on U.S. domestic satellites and international satellites, including Panamsat, Columbia/TDRS, Intelsat, Anik, and Morelos.

INTELSAT (INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION)

3400 International Drive NW
Washington, DC 20008-3098 USA
(202)944-6800; fax: (202)944-7898; web site: www.intelsat.int:8080/
■Year established: 1964; 600 employees; 1995 revenues: $706,300,000; area served: worldwide
■Tony Trujillo, Corporate and Marketing Communications Director, (202)944-7500; Intelsat Operations Center, (202)944-6781; Television Service Center (TVSC), (202)944-6797; Irving Goldstein, Director General and Chief Executive Officer; David Tudge, Vice President and Chief Financial Officer; James Johnson, Director of Procurement
■Brokers time on the Intelsat system.

INTERNATIONAL TELECOMMUNICATIONS CORPORATION INC.

7005 Taschereau Boulevard, Suite 374
Brossard, PQ J4Z 1A7 CANADA
(514)926-0040; fax: (514)926-0999
■Michel Savard, President

INTERSPUTNIK (INTERNATIONAL ORGANIZATION OF SPACE COMMUNICATIONS)

2nd Smolensky, 1/4
Moscow, 121099 RUSSIA
+7 (095)244 0333; fax: +7 (095)253 9906; e-mail: dir@intersputnik.msk.ru
■Year established: 1971; 37 employees; area served: Atlantic and Indian Ocean regions; ownership: government
■Gennady G. Kudryavtsev, Director General, (095)244-03-33; Istvan Kovach, Deputy General Director, (095)244-03-33; Joseph Dolecki, Director of Operations, (095)244-05-03; Neil Bakmann, Director of Marketing, (095)244-06-98; Victor Romantsov, Director of Development and Technology, (095)244-04-56; Booking Office (24 hours daily), (095)241-72-73
■Brokers time on the Gorizont/Statsionar and Express systems.

JAPAN BUSINESS TELEVISION INC. (JBTV)

900 Circle 75 Parkway
Atlanta, GA 30339 USA
(770)612-0070; fax: (770)612-0066; e-mail: yasushi@jbtv.com
■Year established: 1989; area served: worldwide
■Kiyotaka Fujisaki, Chairman; Yoshihiko Itami, President and Chief Executive Officer; Yasushi Furukawa, Director of International Operations
■Brokers long-term, short-term and occasional-use capacity on Galaxy VII and JCSat-1.

JAPAN BUSINESS TELEVISION INC. (JBTV)

383-13 Kitaaoyama, Minato-ku
Tokyo, 107 JAPAN
+81 (03)3470-3080; fax: +81 (03)3470-7593
■Year established: 1989; area served: Japan and USA; ownership: private
■Kiyotaka Fujisaki, Chairman; Yoshihiko Itami, President and Chief Executive Officer; Yasushi Furukawa, Director of International Operations
■Brokers long-term, occasional-use and short-term capacity on Galaxy VII, JCSat-1 and JCSat-2.

JAPAN SATELLITE SYSTEMS INC. (JSAT)

Toranomon 17 Mori Building, 5F, 1-26-5, Toranomon, Minato-ku
Tokyo, 105 JAPAN
+81 (335)511-7778; fax: +81 (333)597-0601; web site: www.iijnet.or.jp/jsat/
■Maki Sato, Corporate Communications Staff
■Brokers time on the JCSat system.

K-TECH COMMUNICATIONS

3110 Pinson Valley Parkway
Birmingham, AL 35217 USA
(205)841-1300; fax: (205)849-7631
■Year established: 1982; 21 employees; 1995 revenues: $2,100,000; area served: Alabama and parts of Montana
■J. K. Godwin, President; Kevin Godwin, Chief Marketing Officer
■Brokers occasional-use capacity on Spacenet 1 and 4 and Telstar 402.

KANSAS CITY TELEPORT

3030 Summit
Kansas City, MO 64108 USA
(816)753-0020; fax: (816)932-9182
■Year established: 1981; 10 employees; area served: mid America; parent: Global Access Telecommunications Services; ownership: private
■Bud Turner, Manager
■Brokers occasional-use transponder time on U.S. domestic and international satellite systems.

KELLY BROADCASTING SYSTEMS INC.

Satellite Transmission Division, 414 Eagle Rock Avenue, Skyline Plaza, Suite 200
West Orange, NJ 07052 USA
(201)736-0800; fax: (201)736-5185; web site: www.kbs-tv.com
■Year established: 1991; 60 employees; 1995 revenues: $15,000,000; 1996 projected revenues: $22,000,000; area served: North America, South America, Europe, Middle East; ownership: private
■Michael Kelly, President and Chief Executive Officer; M. P. Renois, Treasurer; Jay Farrar, Sales and Marketing; Dave Huff, Engineering and Operations; Laura Epstein, Accounting and Finance; Craig McDonald, Senior Vice President of Program Distribution; Jose Nunes, Distribution for Latin America; Edward Rogalski, Teleport Operations; Dawn Bates, Administration; Kathy Kelly, Manager of Special Events and Customer Service
■Short-term, long-term, full period and occasional-use capacity on international and domestic satellites.

KEYSTONE COMMUNICATIONS

6430 Sunset Boulevard, Suite 1400
Los Angeles, CA 90028 USA
(213)467-8900; fax: (213)465-8750
■Year established: 1989; 200 employees; area served: worldwide; ownership: private
■David A. Simmons, Chairman and Chief Executive Officer; Barry McCann, Manager of Satellites; Peter Marshall, President; Bret Leifson, Executive Vice President and Chief Financial Officer
■Brokers short-term and occasional-use capacity on Westar 4, GStar 1, Spacenet 1, and Satcom 2R.

KEYSTONE COMMUNICATIONS

110 East 42nd Street, 11th Floor
New York, NY 10017 USA
(212)885-8700; fax: (212)885-8701

■Year established: 1980; 80 employees; area served: worldwide; ownership: private

■Steve McNeely, President; Bret Liefson, Chief Financial Officer; Dave Anderson, Executive Vice President; Russell Bittner, Director of Sales; David Simmons, Chief Executive Officer; Steve Ludwig, Director of East Coast Operations; Gary Horrocks, Chief Engineer; Harley Shuler, Vice President and General Manager for the Eastern Region; Charles Fedorko, Vice President and General Manager for the Western Region; Sheila Laurenceau, Customer Service Representative

KEYSTONE COMMUNICATIONS

303 East South Temple
Salt Lake City, UT 84111-1226 USA
(801)322-4400; fax: (801)531-7375; web site: www.keystonecom.com

■Year established: 1978; 400 employees; 1995 revenues: $100,000,000; 1996 projected revenues: $150,000,000; area served: worldwide; ownership: private

■Bret Leifson, Chief Financial Officer; Blaine Colton, Senior Vice President of Network Services Group

■Brokers long-term, short-term and occasional-use capacity on Galaxy 6, Spacenet 1, GStar 1, Satcom 2R, and others.

KEYSTONE COMMUNICATIONS

9670 Aero Drive
San Diego, CA 92123 USA
(619)569-8451; fax: (619)569-9248

3 employees; area served: southern California

■David E. Simmons, Chairman; Barry McCann, Vice President of Sales and Marketing

■Brokers short-term and occasional-use capacity on Galaxy 6, GStar 1, Spacenet 1, Satcom 2R, and others.

KEYSTONE COMMUNICATIONS

400 North Capitol Street NW, Suite 177
Washington, DC 20001 USA
(202)737-4440; fax: (202)783-5166; web site: www.keystonecom.com

■Year established: 1988; ownership: private

■Steven McNeely, President; Bruce Thomas, Chief Financial Officer; Jim Roche, Regulatory Counsel; David Simmons, Chairman; Harley Shuler, Senior Vice President of Sales and Services

■Brokers long-term, short-term and occasional-use capacity on Westar 4, Galaxy 6, Spacenet 1, GStar 1, and Satcom 2R.

KEYSTONE COMMUNICATIONS CORPORATION

3872 Keystone Avenue South
Culver City, CA 90232 USA
(310)845-3900; fax: (310)845-3901; web site: www.keystonecom.com

■Year established: 1983; 350 employees; area served: worldwide; ownership: private

■Steve McNeely, President; Dave Anderson, Executive Vice President; Gabriel Thomas, Executive Vice President and Chief Financial Officer; David Szeiag, Technical Contact; Bret Leifson, Financial Contact; David Rippon, Purchasing Contact

LEARFIELD COMMUNICATIONS INC.

P.O. Box 104180
Jefferson City, MO 65110-4180 USA
(573)893-7200; fax: (573)893-2321; web site: www.learfield.com

■Year established: 1972; 65 employees; area served: USA; ownership: private

■Charles Peters, General Manager and Chief Engineer of Satellite Division; Clyde Lear, President

■Brokers long-term capacity on Satcom C5.

LEARNSAT SYSTEMS INC.

821 East 46th Street
Stillwater, OK 74074 USA
(405)377-6100; fax: (405)377-6152

■Year established: 1991; 24 employees; 1995 revenues: $2,500,000; 1996 projected revenues: $3,000,000; area served: domestic USA, Europe and Middle East; ownership: private

■Charles Brewer, President; Linda Brewer, Chairman, Chief Executive Officer and Chief Financial Officer; Jim McKin, Sales Manager; Jeff Harjo, Chief Engineer; Darin Buntin, Senior Project Manager

■Brokers time on SBS6.

THE LONE STAR TELEVISION NETWORK INC. (LSTN-TV)

5801 Preston Oaks, Suite 812
Dallas, TX 75240 USA
(214)991-4711; fax: (214)991-7857

■Year established: 1988; 4 employees; area served: USA; ownership: private

■George White, President and Chief Executive Officer; Roger Snell, Vice President and Chief Financial Officer; Jeff Toker, Vice President of Production; Robert Eschbaugh, Vice President of Engineering

LORAL SKYNET SATELLITE SERVICES

900, Routes 202/206, Room 2A 115W, P.O. Box 752
Bedminster, NJ 07921-0752 USA
(800)847-9335; fax: (908)234-7940; web site: www.att.com/skynet/

Area served: USA, Puerto Rico and US Virgin Islands; ownership: public

■Mary Jane McKeever; Joan Byrnes, Director of Marketing and Sales; Ted Corus, Sales Manager; Jim Lowell, Public Relations, (908)221-6148; Hawley Earth Station, (800)242-2422

■Leases full-time and part-time transponder services on the AT&T Telstar 300 and 400 fleet of satellites. Brokers time on the Telstar system.

MAGNETECH CORPORATION

3941 Southwest 47th Avenue
Fort Lauderdale, FL 33314 USA
(954)791-6711; (800)683-3873; (954)328-9541 24 hours; fax: (954)791-6788; e-mail: roboneill@aol.com

■Year established: 1988; 200 employees; 1995 revenues: $30,000,000; area served: USA; parent: SOI Industries; ownership: public

■Jim Weinberg, Chief Operating Officer; Rob O'Neill, Director of Satellite Operations, e-mail: roboneill@aol.com

■Brokers occasional-use capacity.

MANHATTAN MICROWAVE COMMUNICATIONS COMPANY

6 Ferruzza Drive
Chestnut Ridge, NY 10977-6701 USA
(800)825-0111; (914)426-0427; Video: (914)732-8160-5; fax: (914)426-0455; e-mail: 5871762@mcimail.com

■John J. Zelenka, President

■Brokers short-term capacity.

MAXAT LTD.

200 Gray's Inn Road
London, WCIX 8XZ UNITED KINGDOM
+44 0171-430-4400; fax: +44 0171-430-4321; e-mail: s.cleary@maxat.com

■Year established: 1991; 52 employees; 1995 revenues: $13,100,000; area served: Europe, Middle East and USA; parent: France Telecom; ownership: private

■Julian Costley, Chief Executive, e-mail: j.costley@maxat.com; Sophie Cleary, Marketing Executive, e-mail: s.cleary@maxat.com; Sarah Williams, Deputy Chief Executive, e-mail: s.williams@maxat.com; Richard Ward, Chief Engineer, e-mail: r.ward@maxat.com; Francis Rolland, Financial Controller; Simon Mead, Sales Manager

MEDIA CASTING TELECOMMUNICATION INC.

7005 Boulevard Taschereau, Suite 300
Brossard, PQ J4Z 1A7 CANADA
(514)926-0040; fax: (514)926-0999; e-mail: mci@lanternette.com

■Year established: 1992; 10 employees; area served: worldwide; ownership: private

■Michel Savard, President; Danny Romeo, Director of Sales and Marketing, e-mail: dromeo@infini.net; Denis McCarthy, Director of Technical Operations; Chris Babouder, Telecommunication Engineer; Kelly Abrahamian, Telecommunications Engineer

■Provides turnkey solutions offering coordination of events such as the Olympics and Commonwealth games, World Soccer Cup and cultural and news events. Provides access to both domestic and international satellites. Provides space segments, uplinks and downlinks at Ku- and C-bands (includes transportables). Permanent or full-time services include broadcast TV services and program distribution. Occasional or part-time services include satellite news gathering (SNG), special events and specialized services. Provides full- or part-time (occasional) transponder provision. Provides engineering and technical services and teleport services. Brokers long-term, short-term and occasional use transponder time on all commercially available satellites.

MICRONET INC.

2370 York Road, Commonwydds, Building B
Jamison, PA 18929 USA
(215)491-7400; fax: (215)491-0260

■Year established: 1990; 60 employees; 1995 revenues: $11,000,000; 1996 projected revenues: $15,000,000; area served: northeastern USA; parent: Lenfest Communications; ownership: private

■Wayne Johnson, Director of Broadcast Sales and Services; Carl Cangelosi, President and Chief Executive Officer; Tom Connor, Chief Financial Officer; Frank Miller, Director of Operations; Jim Colonna, Director of Engineering; Mark Shlien, Director of Sales

■Transponder brokers and resellers.

MICRONET INC. — SOUTHWEST REGION

3166 One Main Place
Dallas, TX 75202 USA
(214)748-4118; fax: (214)712-3915; web site: swmicronet.com

■Year established: 1989; 25 employees; 1995 revenues: $5,200,000; area served: major markets in TX; parent: Lenfest Communications; ownership: private

■Steven Richards, General Manager, e-mail: richards@swmicronet.com; Robert Thiebaut, Accounts Manager, e-mail: tebo@swmicronet.com; Paul Day, Accounts Manager, e-mail: paulday@swmicronet.com; Debbie Brainard, Accounts Manager, e-mail: debbieb@swmicronet.com; Tom Pegues, Director of Operations, e-mail: tpegues@swmicronet.com

■Provides C- and Ku-band transmission services. Terrestrial, permanent and temporary last mile connection loops. Brokers time on all domestic and most international satellites.

MICROSPACE COMMUNICATIONS CORPORATION

3100 Highwoods Boulevard
Raleigh, NC 27604 USA
(919)850-4500; fax: (919)850-4518; web site: www.microspace.com; e-mail: uplink@microspace.com

■Year established: 1988; 20 employees; area served: USA, Europe, Mexico; parent: Capitol Broadcasting Company Inc.; ownership: private

■Joseph Amor, III, Vice President and General Manager, e-mail: jamor@microspace.com; John Bimrose, Account Executive, e-mail: jbimrose@microspace.com; Bonnie Sullivan-Southard, Account Executive, e-mail: bsullivan@microspace.com; Roland Waddell, Account Executive, e-mail: rwaddell@microspace.com; Carolyn Newey, Engineering Manager, e-mail: cnewey@microspace.com; Greg Hurt, Account Executive, e-mail: ghurt@microspace.com

■Accesses Anik E2, the Galaxy system, the GStar system, Intelsat K, PAS-1, PAS-3, the Satcom system, the SBS system, Spacenet IV, TDRSS-AOR, and the Telstar system.

MINISTRY OF COMMUNICATIONS (KOREA)

100, Sejong-ro, Chongro-gu
Seoul, 110-777 KOREA
+82 42-860-4630; fax: +82 42-860-6465

■Dr. Seon Jong Chung, Vice President of ETRI's Satellite Communications Division

■Brokers time on the Koreasat system.

MINISTRY FOR POSTAL SERVICES AND TELECOMMUNICATIONS (RUSSIA)

7 Tverskaya Street
Moscow, 103375 RUSSIA
+7 (095)925 5108; fax: +7 (095)230 2097
■Aleksandr E. Krupnov, Director of International Cooperation Department
■Brokers time on the Raduga, Gorizont, Ekran, Loutch, and Glonass systems.

MINISTRY OF POSTS AND TELECOMMUNICATIONS (CHINA)

13 West Chanan Avenue
Beijing, 100804 CHINA
+86 (1)601-1250; fax: +86 (1)601-1250
■Zhang Ligui, Director General of Telecommunications; Zhao Xintong, Director of Department of External Affairs
■Brokers time on the DFH and ChinaSat systems.

MINNESOTA PUBLIC RADIO

45 East Seventh Street
St. Paul, MN 55101 USA
(612)290-1500; fax: (612)290-1260; web site: www.mnonline.org/mpr
■Year established: 1967; 200 employees; area served: continental USA; parent: Minnesota Public Radio; ownership: public
■William Kling, President; Ralph Hornberger, Director of Engineering; Perry Carter, Director of Operations
■Brokers transponder time on Galaxy 4, transponder 3 and Satcom K-2, transponder 2.

MOBILE VIDEO SERVICES LTD.

1620 Eye Street NW, Suite 100
Washington, DC 20006 USA
(202)331-8882; fax: (202)331-9064; e-mail: movidwa@clark.net
■Year established: 1978; 30 employees; area served: mid-Atlantic USA; ownership: private
■Larry VanderVeen, President; Michael Demers, General Manager
■Brokers long-term, short-term and occasional-use capacity on Panamsat.

MTA TELEPORT, MUSLIM TV AHMADIYYA

1440 Briggs Chaney Road
Silver Spring, MD 20905 USA
(301)236-9457; fax: (301)879-0222; web site: www.alislam.org; e-mail: mta@islam.ahmadiyya.org
■Year established: 1992; area served: North America, Europe, Asia, Africa; parent: Ahmadiyya Movement in Islam Inc., USA; ownership: private
■Munir Ahmad, Managing Director

MTI/THE IMAGE GROUP INC.

885 Second Avenue, Level C
New York, NY 10017 USA
(212)497-7700; fax: (212)759-7465; web site: www.image_group.com
■Year established: 1976; 250 employees; ownership: private
■Charles Pontillo, President and Chief Operating Officer; Ken Mochtak, Production Manager; Craig Conti, Technical Contact
■Brokers occasional-use transponder time on all U.S. domestic and international satellite systems.

NAHUELSAT S.A.

Lavalle 472, 3° Piso, Capital Federal
Buenos Aires, 1047 ARGENTINA
+54 (1)327-2292; fax: +54 (1)327-2319
■Eckart Schober, Chief Executive Officer; Fidel Morales-Moreno, Marketing and Sales Manager; Veronique Rodrigo Baehr, Responsible Corporate Image and Communication
■Brokers time on the Nahuelsat system.

NETWORKS TELEPORTS INC.

3200 Chartres Street
New Orleans, LA 70117 USA
(504)942-9200; fax: (504)942-9204
■Year established: 1988; 15 employees; area served: North America; ownership: private
■Barbara Lamont, President; Noily Paul, Vice President of Satellite Services; Jon Reinhardt, Manager of Technical Operations; Larry Custer, Sales Manager
■Brokers long-term, short-term and occasional-use capacity on Panamsat and all U.S. domestic satellite systems. Accesses Anik E1, Anik E2, Galaxy I.R, Galaxy III, Galaxy III.R, Galaxy IV, Galaxy V, Galaxy VI, Galaxy VII, GStar I, GStar II, GStar IV, Morelos F-2, Satcom 2R, Satcom C1, Satcom C3, Satcom C4, Satcom C5, Satcom K1, Satcom K2, SBS6, Solidaridad I, Solidaridad II, Spacenet III, Spacenet IV, Telstar 302, Telstar 303, and Telstar 401.

NEW ENGLAND SATELLITE SYSTEMS INC.

433 South Street
Shrewsbury, MA 01545-4805 USA
(508)842-4328; pager: (800)978-8370; fax: (508)842-4857
■Year established: 1980; 20 employees; area served: northeastern USA; ownership: private
■John Foley, Jr., President; Rich Ventura, Operations Manager; Keith Lippert, Director of Sales and Marketing

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NEW YORK NETWORK — STATE UNIVERSITY OF NEW YORK

A. E. Smith Building, 12th Floor, P.O. Box 7012
Albany, NY 12225 USA
(518)443-5333; fax: (518)426-4198; web site: www.sunycentral.edu/nynet/
■Year established: 1967; 27 employees; area served: New York; ownership: government
■William F. Snyder, Executive Director; Roy T. Saplin, Jr., Director of Broadcast Services, e-mail: saplinrt@nyn.sunycentral.edu; Christopher Conto, Manager of Business Development; Richard Fortune, Director of Engineering
■Brokers time on Spacenet III.

NORTH AMERICAN CLS INC.

9200 Basil Court, Suite 306
Largo, MDD 20774 USA
(301)341-1814; fax: (301)341-2130; e-mail: track-it@nacls.com
■Year established: 1990; 6 employees; 1995 revenues: $2,000,000; 1996 projected revenues: $2,000,000; area served: worldwide; parent: CLS (Toulouse, France); ownership: private
■Christopherr Vassal, President; Peter Griffith, General Manager; Stephen Morgan, Director of Business Development, e-mail: weasel@nacls.com; Dana Potts, Project Manager
■Provides data collection and geo-positioning services.

NOVANET COMMUNICATIONS LTD.

725 Westney Road South, Suite 4
Ajax, ON L1S 7J7 CANADA
(905)686-6666; fax: (905)619-1053; web site: www.novanetcomm.com; e-mail: getinfo@novanetcomm.com
■Year established: 1989; 8 employees; 1995 revenues: 5,500,000 CN; 1996 projected revenues: 7,000,000 CN; area served: North America; ownership: private
■Joe Uyede, President and Chief Executive Officer; Donald Witzel, Sales and Marketing Director, e-mail: dgwitzel@novanetcomm.com; Michael Taylor, Senior Vice President; Geoff Wade, Manager of Client Operations, e-mail: gwade@novanetcomm.com; Stewart Sheriff, Client Systems, e-mail: ssheriff@novanetcomm.com
■Accesses the Anik E1, Anik E2, Galaxy IV, and SBS5 satellites.

NSN NETWORK SERVICES

P.O. Box 578
Avon, CO 81620 USA
(970)949-7774; fax: (970)949-9620; web site: nsn.net; e-mail: sales@nsn.net
■Year established: 1988; 15 employees; 1995 revenues: $5,000,000; area served: worldwide; ownership: private
■Bill Sepmeier, Vice President of Engineering; Muffy Montemayor, President; Kelly Hethcote, Sales Contact

NTT MOBILE COMMUNICATIONS NETWORK INC.

Shin-Nikko Building, 10-1, Toranomon 2-chome, Minato-ku
Tokyo, 105 JAPAN
+81 (3)5563-7252; fax: +81 (3)5563-7088; web site: www.nttdocomo.co.jp; e-mail: wang@cpd.nttdocomo.co.jp
■Year established: 1992; 2,870 employees; area served: Japan; parent: NTT
■Haruo Yamaguchi, Chairman; Kouji Takeuchi, President; Yoshiyuki Yasuda, Senior Engineer; Hironobu Takeuchi, Vice President
■Brokers time on the N-Star system.

NUOVA TELESPAZIO SPA

Via Tiburtina 965
Rome, I-00156 ITALY
+39 (6)406 931; fax: +39 (6)620 424
■Luigi Ruspantini, Commercial Manager
■Brokers time on the Italsat system.

OPTUS COMMUNICATIONS PTY. LTD.

ACN 052833208, Optus Communications, 101 Miller Street
North Sydney, NSW 2000 AUSTRALIA
+61 (2)342-7800; fax: +61 (2)342-7100
■Mark Harwood, Sales Manager, Media and Communications; David Foster, Corporate and Public Affairs Manager
■Brokers time on the Optus system.

ORBCOMM GLOBAL L.P.

21700 Atlantic Boulevard
Dulles, VA 20166 USA
(703)406-6000; fax: (703)406-3504; web site: www.orbcomm.net; e-mail: aparker@orbcomm.net
■Year established: 1990; 90 employees; area served: worldwide; parent: Orbital Sciences Corporation and Teleglobe; ownership: private
■Alan L. Parker, President and Chief Executive Officer, e-mail: aparker@orbcomm.net; Bartlett Snell, Senior Vice President of Finance and Administration (CFO), e-mail: bsnell@orbcomm.net; Robert Pizzimenti, Executive Vice President of Marketing and Business Development, e-mail: rpizzimenti@orbcomm.net; Mary Ellen Seravalli, Vice President and General Council, e-mail: mseravalli@orbcomm.net; Andre Halley, Managing Director of International Business Development, e-mail: ahalley@orbcomm.net; Paul Locke, Acting Vice President of Engineering and Operations, e-mail: plocke@orbcomm.net
■Brokers time on Orbcomm.

ORION ATLANTIC L.P.

Satellite Services, 2440 Research Boulevard, Suite 400
Rockville, MD 20850 USA
(301)258-3233; fax: (301)258-3256
■Year established: 1982; 175 employees; 1995 revenues: $22,284,000; area served: North America, Europe and Transatlantic; parent: Orion Network Systems Inc.; ownership: public
■Douglas Newman, President; Jack Albert, Senior Vice President and General Manager of Satellite Services; Arthur N. Hill, II, Executive Director of Satellite Services; Ruth Burke, Booking Coordinator; Burt Liebowitz, Vice President of Product Development; Richard Greco, Senior Vice President of Marketing; Richard Mortellaro, Director of Marketing, Satellite Services
■Brokers time on the Orion system.

PANAMSAT CORPORATION
One Pickwick Plaza
Greenwich, CT 06830 USA
(203)622-6664; fax: (203)622-9163; web site: www.panamsat.com; e-mail: webmaster@panamsat.com
■Year established: 1984; 200 employees; 1995 revenues: $116,000,000; area served: worldwide; ownership: public
■Frederick A. Landman, President and Chief Executive Officer; Lourdes Saralegui, Executive Vice President; Patrick Costello, Chief Financial Officer; James Cuminale, Senior Vice President and General Counsel; Robert Bednarck, Senior Vice President, Engineering and Operations; Michael Antonovich, Vice President and General Manager of Broadcast Services; Daniel Marcus, Vice President of Corporate Communications; Ammar Hanafi, Vice President of Business Development; David Berman, Senior Vice President of Broadcast Sales; Andrew Jordan, Senior Vice President for Asia; Alvaro Gazzolo, Regional Vice President for Latin America; Kevin Burgoyne, Director of Corporate Communications, e-mail: burgoynk@grn.panamsat.com
■Brokers time on the PAS system.

PRODUCTION & SATELLITE SERVICES INC.
11860 Mississippi Avenue
Los Angeles, CA 90025 USA
(310)575-4400; fax: (310)575-4451
■Year established: 1986; 25 employees; area served: western USA and Chicago; ownership: private
■Robert C. Lamb, Principal and Vice President of Production and Operations; Charles P. Storlie, Principal and Vice President of Sales and Engineering; Nancy Lurie, Director of Operations
■Brokers occasional-use transponder time on all domestic and international satellite systems.

PROSTAR
12831 Royal Drive
Stafford, TX 77477 USA
(713)240-2800; fax: (713)240-1447
■Year established: 1984; 20 employees; area served: USA, Canada and Mexico; ownership: private
■John C. Parks, President; Scott Hofmann, Director of Marketing; Mal Lusky, Chief Financial Officer; Alan Barlow, Manager of Technical Operations
■Brokers occasional-use transponder time on the Galaxy satellite system.

PT. PASIFIK SATELIT NUSANTARA
Sentra Mulia, Suite 1201, J1. H.R. Rasuna Said Kav. X6, No. 8
Jakarta, 12940 INDONESIA
+62 (021)522-9292; fax: +62 (021)522-9293; e-mail: psnsat@rad.net.id
■Year established: 1991; 72 employees; 1995 revenues: $2,246,026; 1996 projected revenues: $11,767,924; area served: Asia Pacific
■Adi Rahman Adiwoso, Chief Executive Officer and President; Kevin Smyth, Marketing and Sales Contact; Achadiat Dj, Operations Director; Rian Alisjahbana, Finance Director; L. Woerfiendarti, Regulatory and Corporate Affairs Director
■Brokers time on the Palapa system.

RAINBOW NETWORK COMMUNICATIONS
150 Crossways Park West
Woodbury, NY 11797 USA
(516)396-3553; fax: (516)364-6463
■Year established: 1983; 140 employees; area served: USA; parent: Rainbow Programming Holding Inc.; ownership: private
■Thomas A. Greco, Senior Director of Business Development and Marketing; John McLaughlin, Manager of Sales and Marketing; Steve Pontillo, Vice President of Engineering and Technical Services
■Long-term, short-term and occasional-use capacity.

RIMSAT LTD.
6920 Pointe Inverness Way, Suite 150
Fort Wayne, IN 46804 USA
(219)436-3800; fax: (219)436-9669
■Paul E. Underwood; Michael Sternberg; Edmund J. Habib, Vice President of Engineering and Operations
■Brokers time on the Rimsat system.

ROSEBUD PRODUCTIONS INC.
40 SE 5th Street, Suite 600
Boca Raton, FL 33432 USA
(800)393-1247; (561)362-5677; fax: (561)361-9423; e-mail: finfreedom@aol.com
■Year established: 1992; 4 employees; 1995 revenues: $50,000; 1996 projected revenues: $150,000; area served: southeastern USA; parent: Barry Financial Group, Inc.; ownership: private
■James A. Barry, Jr., President and Chief Executive Officer; Rosemarie Barry, Vice President and Controller; Douglas E. Curtis, Vice President of Marketing and Telecommunications, e-mail: finfreedom@aol.com; Ken Stanford, Engineer
■Brokers Ku-band short-term capacity on Panamsat and Intelsat K satellites.

SAN DIEGO TELEPRODUCTIONS
4004 La Salle Street
San Diego, CA 92110 USA
(619)293-7777; fax: (619)223-3626; web site: www.sdtvcom.com
■Year established: 1979; 10 employees; area served: western USA; ownership: private
■Mark Yancy, President, e-mail: mark@sdtvcom.com; Michelle Kirkwood, Operations, e-mail: michelle@sdtvcom.com; Carolyn Elliott, Public Relations
■Brokers occasional-use capacity on all U.S. domestic satellites.

SATELLITE BROADCASTING INC.
P.O. Box 4121
Englewood, CO 80155-4121 USA
(303)790-1110; fax: (303)790-1151; e-mail: irl3@ix.netcom.com
■Year established: 1984; area served: worldwide; ownership: private
■Irl Marshall, President, e-mail: irl3@ix.netcom.com
■Transponder brokers.

SATELLITE COMMUNICATION SYSTEMS
P.O. Box 787
Wauconda, IL 60084 USA
(847)526-3020; (800)872-5465; fax: (847)526-5347; web site: www.satellite-commsys.com; e-mail: 76651.424@compuserve.com
■Year established: 1979; 10 employees; area served: worldwide; ownership: private
■Robert J. Tomczak, President; Dori Schmitz, General Manager
■Brokers C- and Ku-band capacity on U.S. domestic and international satellites.

SATELLITE MANAGEMENT INTERNATIONAL INC.
820 Avenue F, Suite 100
Plano, TX 75074 USA
(214)881-1700; fax: (214)881-1300
■Year established: 1989; 22 employees; 1995 revenues: $3,200,000; 1996 projected revenues: $5,000,000; area served: worldwide; ownership: private
■Al Bond, President; Michael Bond, Vice President of Operations; Jim Britain, Vice President of Sales and Marketing; Jim Henry, Chief Operating Officer and Chief Financial Officer; Gene Cagle, Director of Engineering
■Brokers long-term, short-term and occasional-use capacity.

SATELLITE NETWORK SYSTEMS INC.
2375 University Avenue West
St. Paul, MN 55114-1603 USA
(612)644-2200; fax: (612)644-8025
■Year established: 1990; 14 employees; area served: worldwide; ownership: private
■Thomas Percich, Vice President and General Manager; Susan Broadribb, Director of Operations; Paul Heinerscheid, President and Chief Executive Officer
■Brokers occasional-use transponder time for contracts.

SATELLITE NETWORK TELEVISION CORPORATION
13 Roszel Road
Princeton, NJ 08540 USA
(609)987-1400; fax: (609)987-9313
■Year established: 1989; 8 employees; area served: USA; parent: Interactive Technologies Corporation
■John Cappuccino, Chief Engineer; Andrew P. Cordery, General Manager; William Schwing, President; Dominick A. Floraa, Marketing Contact

SATELLITE SERVICE COMPANY LTD.
41/103 Rattanathibet Road
Nonthaburi, 11000 THAILAND
+66 (2)591-0736 to 49; fax: +66 (2)591-0706
■Year established: 1994; 26 employees; parent: Shinawatra Satellite PLC; ownership: private
■Dumrong Kasemset, President; Sareewan Audkrit, Professional Accounts; Kobsak Chantalikhit, Manager of Project 4; Mekin Petply, Sales Engineer; Dr. Chindakorn, Manager of Project 3
■Occasional-use capacity on Thaicom 1 and Thaicom 2.

SHINAWATRA SATELLITE PUBLIC COMPANY LTD.
41/103 Rattanathibet Road
Nonthaburi, 11000 THAILAND
+66 (2)591-0736 to 49; fax: +66 (2)591-0706
■Year established: 1991; 103 employees; area served: Asia and Europe; parent: Shinawatra Computer and Communications Group; ownership: public
■Dumrong Kasemset, President; Nipa Chunsaard, Finance and Accounting Manager; Nongluck Phinainitisart, General Manager; Yongsit Rojsrivichaikul, Sales and Marketing Manager; Ukrid Stresthaphunlarp, Deputy Manager of International Marketing; Avudh Ploysongsang, Managing Director; Pariyanuch Hongsamrerng, Manager of Marketing Communications
■Brokers time on the Thaicom system.

SOCIETE EUROPEENNE DES SATELLITES (SES)
Chateau de Betzdorf
L-6815 LUXEMBOURG
+352 710-725-1; fax: +352 710-725-309; web site: www.astra.lu
■Year established: 1985; 200 employees; area served: Europe; ownership: private
■Yves Feltes, Press Relations Manager, e-mail: yves_feltes@aia.com; Pascale Reuland, Market Communications and Public Relations Assistant, e-mail: pascale_reuland@aia.com; Thomas Herz, Market Communications and Public Relations Manager, e-mail: thomas_herz@aia.com
■Brokers time on the Astra system.

SOUTHERN EXPOSURE SATELLITE COMMUNICATIONS INC.
1380 Climbing Rose Lane
West Palm Beach, FL 33415 USA
(407)379-6041; fax: (407)471-7105
■Year established: 1995; area served: southeastern USA; ownership: private
■Carl Pugliese, Vice President; David McKinley, Vice President
■Long-term capacity, short-term capacity and occasional-use capacity on Galaxy IV, SBS6 and Telstar 401.

SPACE COMMUNICATIONS CORPORATION (SCC)
2-8 Higashi-Shinagawa, 2-chome, Shinagawa-ku
Tokyo, 140 JAPAN
+81 (3)5462-1370; fax: +81 (3)5462-1391
■Year established: 1985; 170 employees; area served: Japan, Taiwan, Korea; parent: Mitsubishi Corporation; ownership: private

■Katsutake Matsuoka, Director of International Marketing and Sales Department; Teruhiko Ena, President and Director; Osamu Yamanaka, Director; Michiho Tunaku, Director

■Brokers time on the Superbird system.

SPACECOM—SATELLITE COMMUNICATION SERVICES LTD.

Twin Towers II, Suite 917, 35 Jabotinsky Street
Ramat Gan, 52511 ISRAEL
+972 3-613 4720; fax: +972 3-613 4723; e-mail: spacecom@netvision.net.il

■Year established: 1993; ownership: private and government-owned; area served: Central Europe and Middle East

■Mirit Hemy, Regional Marketing Manager

■Brokers time on the AMOS system.

SPACECOM SYSTEMS INC.

One Technology Plaza, 7140 South Lewis Avenue
Tulsa, OK 74136-5422 USA
(800)950-6690; fax: (918)488-4848; web site: www.spacecom.com; e-mail: info@spacecom.com

■Year established: 1986; 69 employees; parent: United Video Satellite Group; ownership: public

■Al Stem, Vice President and General Manager, e-mail: al@spacecom.com; Mike Odneal, Marketing and Sales Contact, e-mail: mike@spacecom.com; Dale Bailey, Technical Contact, e-mail: dale@spacecom.com

■Brokers time on Galaxy IV, Spacenet III and Satcom C5.

SPACELINE COMMUNICATIONS SERVICES GMBH

Hans-Gunther-Sohl-Str. 1, Thyssen Trade Center
Dusseldorf, D-40235 GERMANY
+49 2119-677-574; fax: +49 2119-677-569; e-mail: kammerme@thu.ttc.thu.dbp.de

■Year established: 1992; 42 employees; 1995 revenues: 14,300,000 DM; 1996 projected revenues: 30,000,000 DM; area served: worldwide; parent: Thyssen Telecom AG, ITOCHU, EDS; ownership: private

■Bernd Schlobohm, Managing Director; Dan Ellenbogen, Head of Business Unit Satellite Corporate Networks; Jorg Kremer, Director of Finance and Controlling; Klaus Austermann, Director of Customer Services; Wolfhard Scherping, Director of Video Services

SPECTOR ENTERTAINMENT GROUP

6349 Palomar Oaks Court
Carlsbad, CA 92009 USA
(619)438-9080; fax: (619)438-0968

■Year established: 1985; 50 employees; 1995 revenues: $12,000,000; 1996 projected revenues: 12,000,000; area served: worldwide

■Edward M. Spector, President; Gino Coladonato, Transponder Coordinator; Evan Spector, Vice President of Operations; Eric Spector, Executive Vice President

■Provides satellite space segment coordination; transponder rental, lease and sales services on domestic satellites; mobile C-band uplink equipment; mobile television production studios, post-production facilities; and program distribution services.

STAR SATELLITE TELEVISION AND RADIO INC.

2919 Paper Lane
Newport Beach, CA 92660 USA
(714)645-5444; fax: (714)645-5445

■Year established: 1979; area served: worldwide; ownership: private

■Timothy Kuglin, President; Bruce Whitehead, Vice President of Operations; Mary Soher, Satellite Network Coordinator

■Brokers occasional-use capacity on all U.S. domestic and international satellites.

STARBIRD SATELLITE SERVICES

The Interchange, Oval Road
London, NW1 7EP UNITED KINGDOM
+44 171-410-5255; fax: +44 171-413-8326

■Year established: 1990; 17 employees; area served: worldwide; parent: Worldwide Television News; ownership: private

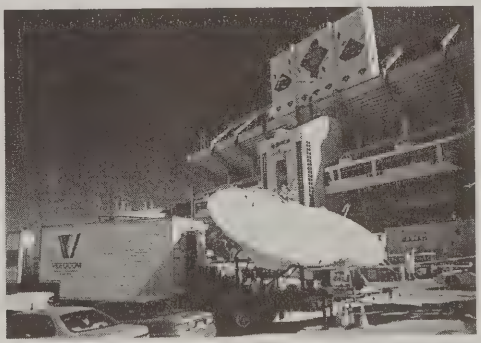
■Patrick Evans, Operations Manager; Richard Aggus, General Manager; Simon Wilkinson, Sales and Marketing

■Brokers ad hoc capacity on Eutelsat and Intelsat and both ad hoc and full-time services on Orion 1.

SURE SHOT TRANSMISSIONS INC.

10344 Main Street
New Middletown, OH 44442 USA
(330)542-0900; fax: (330)542-1020

■Year established: 1986; 12 employees; 1995 revenues: $8,000,000; 1996 projected revenues: $8,000,000; area served: continental USA and Canada; ownership: private



VIDEOCOM
SATELLITE
ASSOCIATES
BOSTON/NASHVILLE
617/329-4080 800/486-4080

- Studio and Program Origination Facilities
- Single Camera IFB Insert Service
- Digital Video Distribution
- Audio Distribution and Data Transmission Service
- Interconnected to Over 350 Locations in the Boston Area
- Transportable KU & C-Band Services Available Nationwide

Circle 474 on reader service card

■Dennis Kunce, President; Clif Poss, Director of Engineering; Kathi Davidson, Director of Uplink Operations; Jean Head, Director of Satellite Services
■Brokers C- and Ku-band capacity.

SWEDISH SPACE CORPORATION

P.O. Box 4207
S-171 04 SWEDEN
+46 (8)627 6200; fax: +46 (8)627 6364; web site: www.ssc.se; e-mail: telecom@ssc.se
■Year established: 1972; 281 employees; 1995 revenues: 255.7 MSEK; 1996 projected revenues: 395 MSEK; area served: Scandinavia and Eastern Europe; ownership: government
■Anders Bjorkman, Head of Broadcasting Services
■Brokers time on the Tele-X and Sirius systems.

SYNERGISTIC TECHNOLOGIES INC.

Three Parkway Center, Suite 102
Pittsburgh, PA 15220 USA
(412)928-0448; fax: (412)928-0451; e-mail: jluff@stinet.com
■Year established: 1984; 20 employees; 1995 revenues: $4,500,000; area served: worldwide; ownership: private
■John Luff, President; Gil Hanna, Manager of Satellite Technical Operations; David Tyszarcyk, Controller
■Brokers long-term capacity on the Anik, CD Radio, Galaxy, GStar, Hispasat, Orion, PAS, Satcom, SBS, Solidaridad, Spacenet, TDRSS, Telstar systems, and Morelos F2.

TAO

31-19, Shiba 2-chome, Minato-ku
Tokyo, 105 JAPAN
+81 (3)3769-6811; fax: +81 (3)3452-7600
■Shin-ichi Watanabe, Director of General Affairs Division; Masami Uemura, General Affairs Division Director
■Brokers time on the BS3 Yuri and CS3 Sakura systems.

TAURUS COMMUNICATIONS INC.

860 Worcester Road, P.O. Box 2861
Framingham, MA 01701 USA
(508)877-2210; fax: (508)877-1760
■Year established: 1987; 15 employees; ownership: private
■Dudley C. Freeman, President and Chief Executive Officer; Fredrick Mycroft, Manager of Simulcasting Services; Darren S. Freeman, Sales Representative; Mark Lewis, Engineering Manager; Dorothy Reynolds, Satellite Services Manager
■Brokers short-term, long-term and occasional-use capacity on the Express, Galaxy, GStar, Intelsat 5, Intelsat 5A, Intelsat 6, Orion, PAS, and SBS systems and Satcom SN2, SBS5, SBS6, Telstar 302, Telstar 303, and Telstar 401 satellites.

TELECOMUNICACIONES DE MEXICO

Director Tecnico de Satelites y Telepuertos Torre Central de Telecomunicaciones, Eje Central Lazaro Cardenas 567, 12o. Piso, Ala Norte
Col. Navarte, DF 03020 MEXICO
+52 (5)629-1173; fax: +52 (5)538-4226
■Year established: 1989; area served: Mexico, Central and South America, USA, and Canada; parent: SCT; ownership: government
■Juan Manuel Zamudio Zea, Director Tecnico de Satelites y Telepuertos; Carlos Mier y Teran Ordiales, Director General; Alberto Orci Magaue, Director of Finance; Z. Olmedo Lopez, Subdirector Commercial Satellite Systems; Alfanso Rodriguez Ramirez, Programmer
■Brokers time on the Morelos and Solidaridad systems.

TELEFUSION DE FRANCE (TDF)

21-27 rue Barbes
Montrouge, F-92120 FRANCE
+33 (1)4965-1000
■Alain Baget, Department Director; Thierry Bernard, Head of Public Relations
■Brokers time on the TDF system.

TELENOR SATELLITE SERVICES AS

P.O. Box 6914, St. Olavs plass
Oslo, N-0130 NORWAY
+47 22-77-79-50; fax: +47 22-77-79-80; web site: www.telenor.no; e-mail: postmottak-satellite@oslo.satellite.telenor.no
■Gunnar Bjorkavaag, Director of Broadcast Division; Jan Thomas Bahnsen, Marketing Director
■Brokers time on the Thor system.

TELEPORT LONDON INTERNATIONAL

Chacfont Grove, Narcot Lane
Gerrards Cross, Buckinghamshire SL9 8TN UNITED KINGDOM
+44 1494 874 974; fax: +44 1494 874 433
■Year established: 1994; area served: worldwide; parent: SSVC; ownership: private
■Chris Russell, General Manager; Peter Bloomfieco, Head of Sales and Marketing; Bernie Branfieco, Head of Engineering and Operations

TELESAT CANADA

1601 Telesat Court
Gloucester, ON K1B 5P4 CANADA
(613)748-0123; (800)267-1870; fax: (613)748-8712; web site: www.telesat.ca; e-mail: info@telesat.ca
■Year established: 1969; 450 employees; 1995 revenues: $245,000,000; 1996 projected revenues: $220,000,000; area served: North America; parent: Alouette Communications; ownership: private
■Len Stass, Vice President of Space Systems; Dennis Billard, Vice President of Sales and Marketing; Marilynn Wright, Vice President of Human Resources and Administration; Laurier (Larry) J. Boisuert, President and Chief Executive Officer; Ted Ignacy, Vice President of Finance; Paul Bush, Director of North American Sales and Marketing; Len Lawson, Director of Sales; Don Weese, Vice President of Engineering
■Brokers capacity on the Anik system.

TELEVISION NEW ZEALAND SATELLITE SERVICES

100 Victoria Street, P.O. Box 3819
Auckland, NEW ZEALAND
+64 (9)375-0790; fax: +64 (9)375 0710; web site: www.tvnz.co.nz
parent: TVNZ Group
■Sam Fairhall, General Manager of Satellite and Pacific Services; Lewis Woodburn, Satellite Manager; John West, Operations Manager; Bill Black, Technical Manager
■Provides occasional and interant capacity on 9, 8 Mbs, MPEG II circuits, Intelsat POR/IOR, C-band uplink and end to end services including New Zealand, Australia, USA, Canada, and Japan with regional interconnect to points globally. Has C- and Ku-band capability.

TMI COMMUNICATIONS AND COMPANY LIMITED PARTNERSHIP

1601 Telesat Court, P.O. Box 9826
Ottawa, ON K1G 5M2 CANADA
(613)742-0000; fax: (613)742-4100; web site: www.msat.tmi.ca
■Year established: 1993; 185 employees; parent: BCE; ownership: private
■Janine Buis, Marketing and Corporate Communications Manager, e-mail: j.buis@tmi.ca; John Farrell, President and Chief Executive Officer, e-mail: j.farrell@tmi.ca; Jim Hone, Chief Financial Officer; Lynda Partner, Vice President of Sales and Marketing; Glen Egan, Director of Sales; Kerry Felstead, Technical Contact; Kay Blakely, Purchasing Contact; Diane Dekuysscher, Marketing Specialist; Andrea Spitzer, Media Relations
■Brokers time on the MSAT system.

TURK TELEKOM — SATCOM DEPARTMENT

Ziraat Mahallesi Turgut Ozal Bulvari Aydinlikevler
Ankara, 06103 TURKEY
+90 312-313-15-50; fax: +90 312-313-15-97
■Year established: 1953; 638 employees; area served: Turkey, Europe and Central Asia; ownership: public
■Veli Bettenir, Director General; A. Arslan, Head of Finance Department; C. Anik, Associate Director General; Ahmet Cengiz, Chief Engineer; Cem Bilsel, Project Responsibles of Turksat; Tufan Yurlic, Director of Satcom Department
■Brokers time on the Turksat system.

VIDEOCOM SATELLITE ASSOCIATES INC./VIDEOCOM TELEPORT BOSTON

502 Sprague Street
Dedham, MA 02026 USA
(617)329-4080; fax: (617)329-8534
■Year established: 1969; 30 employees; area served: USA; ownership: private
■Frank Cavallo, Vice President and General Manager; Bob Hanson, Operations Manager
■Brokers long-term, occasional-use, short-term, and other capacity.

VISIONLINK (SATELLITE SERVICES)

P.O. Box 669
Andover, Hampshire SP10 2YB UNITED KINGDOM
+44 1264-334-342; fax: +44 1264-334-136
■Year established: 1986; area served: worldwide; ownership: private
■Owen J. Paterson, Chief Executive Officer; Georgie Garwood, Administration Director
■Accesses the Eutelsat system, Intelsat K, Orion 1, PAS-1, and PAS-2.

VISTA SATELLITE COMMUNICATIONS INC.

3111 University Drive, Suite 418
Coral Springs, FL 33068 USA
(954)755-7995; fax: (954)755-7996
■Year established: 1987; 5 employees; area served: worldwide; ownership: private
■Roy Liemer, President; Geri Liemer, Vice President; Anthony De Vita, Director of Operations
■Brokers long-term, short-term and occasional-use capacity on all domestic and international satellite systems. Appraises full transponders for remarketing and/or sales/leaseback.

VOYAGER TELECOMMUNICATIONS INC.

8700 Centreville Road, Suite 420
Manassas, VA 22110 USA
(703)551-2075; fax: (703)330-8735
■Year established: 1995; 20 employees; 1995 revenues: $1,000,000; 1996 projected revenues: $6,000,000; area served: worldwide; ownership: private
■Scott Miller, President; Bill Page, Executive Vice President; Terri Miller, Marketing Director
■Provides full- and part-time capacity on C- and Ku-band transponders (domestic and international).

VOYAGER TELECOMMUNICATIONS INC.

P.O. Box 14493
Tucson, AZ 85732-4493 USA
(703)551-2075; fax: (703)330-8735
■Year established: 1995; 20 employees; 1995 revenues: $1,000,000; area served: worldwide; ownership: private
■Scott Miller, President; Bill Page, Executive Vice President; M. Grant Hopkins, Vice President; Londa Hopkins, Office Manager; Terri Miller, Marketing Director; Terry Riester, General Manager
■Provides full- and part-time capacity on C- and Ku-band transponders (domestic and international).

THE WOLD ORGANIZATION LTD.

814 Amherst Avenue, Suite 201
Los Angeles, CA 90049-5292 USA
(310)826-0487; fax: (310)447-5954
■Year established: 1990; 3 employees; area served: worldwide; ownership: private
■Robert N. Wold, President
■Brokers long-term, short-term and occasional-use capacity on communications satellites.

SECTION 7

INTERGOVERNMENTAL POLICY ORGANIZATIONS

Included in This Section:

This section covers multinational organizations that coordinate and standardize international telecommunications. A typical entry contains the following elements:

1. Organization name;
2. Address;
3. Telephone and fax numbers.

How to Use This Section:

This section is organized alphabetically by organization name.

INTERGOVERNMENTAL POLICY ORGANIZATIONS

ARAB SATELLITE COMMUNICATIONS ORGANIZATION (ARABSAT)

P.O. Box 1038
Riyadh, 11431 SAUDI ARABIA
+966 1 4646666; fax: +966 1 4656983; web site: www.arabsat.com

■Year established: 1976; 100 employees; 1995 revenues: $53,000,000; area served: Arab nations; ownership: Arab states, PTTs

■Saad A. Al-Bidnah, Director-General; Said Al-Qahtani, Assistant Director-General; Mohammed Osman, Director of Planning and Projects; Nahil A. Shanti, Director of Planning and Projects

■Established by the member states of the Arab League to serve the needs of telecommunication, information, culture, and education sectors. Arabsat was entrusted with the design, implementation and operation of the Arab space sector to render public and private services in the field of telecommunications, in accordance with the international technical and economical standards.

COMITE INTERNATIONAL MARITIME

26 rue Antoine Breart, Boite 1
Brussels, B-1060 BELGIUM
+32 2 5379592

COMMISION OF THE EUROPEAN COMMUNITIES

Rue de la Loi 200
Brussels, B-1049 BELGIUM
+32 2 2991111; fax: +32 2 20148

■Michel Carpentier, Director of Telecommunications

■Established in order to create an open market for goods and services in European countries. Recent proposals and recommendations include opening access to public telecommunications contracts, improving access to telecommunications services and coordinating ISDN and a pan-European mobile communications network. Future plans include a directive on competition in the telecommunications market and on the establishment of the internal market for telecommunications services through the implementation of Open Network Provision.

CONFERENCE OF EUROPEAN POSTS AND TELEGRAPHS

Liaison Office, Casse Postale
Berne, CH-3001 SWITZERLAND
+41 31 622081; fax: +41 31 622078
Year established: 1956; 31 employees

EUROPEAN TELECOMMUNICATIONS SATELLITE ORGANIZATION (EUTELSAT)

Tour Maine-Montparnasse, 33 avenue du Maine
Paris-Cedex 15, F-75755 FRANCE
+33 1 45384757; fax: +33 1 45383700

■Year established: 1977; 230 employees; 1995 revenues: ECU 260m; area served: Europe, Mediterranean Basin

■Jean Grenier, Director-General; Giuliano Berretta, Technical Director; Andreas Langemeyer, Technical Director; D. G. Hardman, Finance Director; Jesus Domingo Laborda, Operations Director; Vanessa O'Connor, Head of Press and Public Relations

■Operates satellites for fixed and mobile communications in Europe and the Mediterranean Basin. The organization's members are private and public telecommunications operators in 44 European countries. The Eutelsat satellites are used for public telephony, business communications, Eurovision, and Euroradio exchanges, satellites newsgathering, television delivery to cable and community networks and direct-to-home antennas, and for the Euteltracs land mobile messaging and positioning system.

INTERNATIONAL MOBILE SATELLITE ORGANIZATION (INMARSAT)

99 City Road
London, EC1Y 1AX UNITED KINGDOM
+44 71 7281000; fax: +44 71 7281044

■Year established: 1979; area served: worldwide

■Warren Grace, Director-General; Elizabeth Hess, Manager of Press Office; Eugene Jilg, Executive Vice President; George Symernidis, Executive Vice President; Keith Thacker, Executive Vice President; Gavin Trevitt, Corporate Communications; Paul Branch, Director of Engineering; Ramin Khadem, Chief Financial Officer; Perry Melton, Head of Procurement

■An internationally-owned cooperative with 78 member countries, provides global mobile communications for commercial, distress and safety applications, at sea, in the air and on land. Representatives of member countries meet every two years (Assembly). Council members meet three times a year.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

1 rue de Varembe, Casse Postale 56
Geneva 20, CH-1211 SWITZERLAND
+41 22 7490111; fax: +41 22 7333430; web site: www.iso.ch; e-mail: central@isocs.iso.ch

■Year established: 1947; area served: worldwide; ownership: non-profit

■Lawrence D. Eicher, Secretary General

■Non-governmental organization that promotes standardization worldwide.

INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION (INTELSAT)

3400 International Drive NW
Washington, DC 20008-3098 USA
(202)944-6800; fax: (202)944-7898; web site: www.intelsat.int; e-mail: marketing.communications @intelsat.int

■Year established: 1964; 600 employees; 1995 revenues: $805,000,000; area served: worldwide; ownership: international cooperative

■Irving Goldstein, Director-General and Chief Executive Officer; Gary Smith, Vice President of Sales and Marketing; Claude Burgio, Vice President of Engineering; Joe Corbett, Controller; Thomas Neuman, Director of Procurement; Tony Trujillo, Director of Corporate Communications

■Provides worldwide, voice/data and video communications via its 24-satellite network to over 200 countries around the world.

INTERNATIONAL TELECOMMUNICATIONS UNION (ITU)

Place de Nations
Geneva, CH-1211 SWITZERLAND
+41 22 7306666; +41 22 7305554; fax: +41 22 7337256; web site: www.itu.ch

■Area served: worldwide

■Pekka Tarjanne, Secretary-General; Henry Chasia, Deputy Secretary-General

■International organization within which governments and the private sector coordinate global telecommunications networks and services. ITU activities include the coordination, development, regulation, and standardization of telecommunications and organization of regional and world telecom events.

INTERNATIONAL TELECOMMUNICATIONS USERS GROUP (INTUG)

31 Westminster Palace Gardens, Artillery Row
London, SW1P 1RR UNITED KINGDOM
+44 1 717992446; fax: +44 1 717992445

■Year established: 1974; 4 employees; area served: worldwide; ownership: non-profit

■W. M. Coopman, Jr., Chairman; G. McKendrick, Executive Director

■User representation on international telecommunications.

INTERSPUTNIK (INTERNATIONAL ORGANIZATION OF SPACE COMMUNICATIONS)

2nd Smolenskyi, 1/4
Moscow, 121099 RUSSIA
+7 095 2440333; fax: +7 095 2539906
Year established: 1971

■G. G. Kudryavtsev, Director-General; I. Kovacs, Economic and Legal Director; N. Bakmann, Marketing Director; J. Dolecki, Director of Operations

■Intersputnik is a direct access satellite organization. The organization was founded as a Comecon-rival of Intelsat. Any government can join Intersputnik and make use of its services. Non-member users can use its services too. Intersputnik is governed by a council on which each member has one representative and one vote. Intersputnik has direct access to its space capacity, which is currently used by over 188 users from 70 different countries.

SOCIETE INTERNATIONALE DES TELECOMMUNICATIONS AERONAUTIQUES

112 Avenue Charles de Gaulle
Neuilly-Sur-Seine, F-92522 FRANCE
+33 1 47385000; fax: +33 1 47471542

SECTION 8

NATIONAL DATA, REGULATION AND POLICY

Included in This Section:

This section contains extensive information on geographical, demographical and technical information on more than 300 countries, territories and islands.

How to Use This Section:

This section is arranged alphabetically by country, territory and island name. If an entry reads "NA," the information was not available at press time.

NATIONAL DATA, REGULATION AND POLICY

AFGHANISTAN

Official name: Islamic State of Afghanistan
Capital: Kabul
ITU country abbreviation: AFG
ITU Region: 1

International telephone dialing code: 93
International telex dialing code: 930

Demographic and Physical Information

Area: 647,500 km²
Population: 21.26 million
Major languages: Pashtu, Dari, Turkic
Time zones: GMT +4h30m

Telecommunications Statistics

Number of telephones: 31,200
Submarine cable connections: 0
Radio stations: 5 AM
Television standard: SECAM D
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 0
Television stations: 1
Television sets: 100,000
TV households: NA
Cable penetration: 0
VCR penetration: NA
Satellite Earth Stations: 1

Telecommunications Regulatory Organization

Ministry of Communications
Kabul, Afghanistan
Telephone: 25219

Officials

Said Mohammed Nasim Alawi, Minister of Communications
Ghulam Nabi Bazegar, Deputy Minister of Communications

Broadcasting Services

People's Radio and Television Afghanistan — RTA
P.O. Box 544
Kabul, Afghanistan
Telephone: +93 25 622
Telex: 288

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Communications
Ownership: 0.050000%
Earth Station and satellites: 1

Range of Geostationary satellites visible

Location	Kabul
Lat.°	34.5N
Long.°	69.2E
°Long. Differ. Visible	74°
Eastern Limit for GSO	143°E
Western Limit for GSO	355°E (5°W)

ALBANIA

Official name: Republic of Albania
Capital: Tirane
ITU country abbreviation: ALB
ITU Region: 1

International telephone dialing code: 355
International telex dialing code: 0604

Demographic and Physical Information

Area: 28,750 km²
Population: 3.5 million
Major languages: Albanian (Tosk)
Time zones: GMT +2h

Telecommunications Statistics

Number of telephones: 55,000
Submarine cable connections: 0
Radio stations: 17 AM, 1 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: NA
State-run television networks: 1
Private television networks: none
Television stations: 9
Television sets: 255,000
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

General Directorate Posts, Telegraphes et Telephones
42 Myslym Shyri St.
Tirane, Albania
Telephone: 8543

Officials

Hassan Behleshi, Director General
Met Rreli, Deputy Director General
Apostol Lula, Director of Telecommunications
Fadid Smajli, Director

Broadcasting Services

General Directorate of Radio and Television
16 Lek Dukagjini St.
Tirana, Albania
Telephone: 7745

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary satellites visible

Location	Tirane
Lat.°	41.3N
Long.°	19.8E
°Long. Differ. Visible	72°
Eastern Limit for GSO	92°
Western Limit for GSO	308°E (52°W)

ALGERIA

Official name: Democratic and Popular Republic of Algeria
Capital: Algiers
ITU country abbreviation: ALG
ITU Region: 1

International telephone dialing code: 213
International telex dialing code: 936

Demographic and Physical Information

Area: 2.38 million km²
Population: 28.5 million
Major languages: Arabic (official), French
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 822,000
Submarine cable connections: 5
Radio stations: 26 AM

Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 127,220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 18
Television sets: 1.6 million
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 AOR, 1 IOR Intelsat; 1 Intersputnik; 1 Arabsat

Telecommunications Regulatory Organization

Le Ministre des Postes et Telecommunications
4, Boulevard Salah Bouakouir
Algiers, Algeria
Telephone: 2 719260
Telex: 0408-67020
Fax: 2-646-990

Officials
Mr. Baghdadi, Director of Transmissions

Broadcasting Services

Entreprise Nationale de Téfédiffusion
Centre Nodal
Bouzareah
Algiers, Algeria
Telephone: 2-941-654
Fax: 2-941-198

Television Algerie — RTA
21 Boulevard des Martyrs
Algiers, Algeria
Telephone: 2-60 23 00 Programs: 2-60 20 65
Fax: 2-60 19 22 Programs: 2-59 31 80
Telex: 66101/65282

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat)
Investment share 1.72%

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)

International Maritime Satellite Organization (Inmarsat)
Investment share 0.05%

International Telecommunications Satellite Organization (Intelsat)
Signatory: Gentel Alger
Telephone: 2-71 12 20
Fax: 2-61 800
Telex: 67020
Ownership: 0.313718%
Earth station and satellites: 2 (1 AOR, 1 IOR)
Lakdharia 1 — IOR Primary — 60.0
Lakdharia 3 — AOR Primary — 335.5

Range of Geostationary Satellites Visible

Location	Algiers
Lat.°	36.7°N
Long.°	3.1°W
°Long. Differ. Visible	73°
Eastern Limit for GSO	76°E
Western Limit for GSO	290°E (70°W)

AMERICAN SAMOA

Status: Territory of the United States
Capital: Pago Pago
ITU abbreviation: SMA
ITU Region: 3

International telephone dialing code: 684
International telex dialing code: NA

Demographic and Physical Information

Area: 199 km²
Population: 57,366
Major languages: Samoan, English
Time zones: GMT - 11h

Telecommunications Statistics

Number of telephones: 8,399
Submarine cable connections: NA
Radio stations: 1AM, 1 FM
Television standard: NTSC M
Electrical standard: 120 vac, 60 Hz
State-run television networks: 0
Private television networks: 0
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat POR, 1 Comsat

Telecommunications Regulatory Organization

Director of Communications
American Samoa Government
Telephone: 633-1121
Telex: 782 502
Telegraph: Dircomm Pago Pago

Range of Geostationary Satellites Visible

Location	Pago Pago
Lat.°	14.3°S
Long.°	170.7°W
°Long. Differ. Visible	76°
Eastern Limit for GSO	113°E
Western Limit for GSO	265°E (95°W)

ANDORRA

Official name: Principality of Andorra
Status: co-principality headed by co-princes: the president of France, and the Spanish bishop of Seo de Urgel
Capital: Andorra la Vella
ITU abbreviation: AND
ITU Region: 1

International telephone dialing code: 376
International telex dialing code: NA

Demographic and Physical Information

Area: 450 km²
Population: 65,780
Major languages: Catalan (official); French, Castilian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 17,700
Submarine cable connections: 0
Radio stations: 1 AM
Television standard: none
Electrical standard: 220 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization

Also see Information for France and for Spain

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	La Vella
Lat.°	42.5N
Long.°	1.5E
°Long. Differ. Visible	72°
Eastern Limit for GSO	73°E
Western Limit for GSO	290°E (70°W)

Location	Anegada
Lat.°	18.8N
Long.°	64.3E
°Long. Differ. Visible	76°
Eastern Limit for GSO	11°E
Western Limit for GSO	220°E (140°W)

■ ANGOLA

Official name: Republic of Angola
Capital: Luanda
ITU country abbreviation: AGL
ITU Region: 1

International telephone dialing code: 244
International telex dialing code: 998

Demographic and Physical Information
Area: 1.24 km²
Population: 10 million
Major languages: Portuguese (official); Bantu
Time zones: GMT + 1h

Telecommunications Statistics
Number of telephones: 40,300
Submarine cable connections: 0
Radio stations: 17 AM, 13 FM
Television standard: PAL I
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 6
Television sets: NA
TV households: 80,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization
Ministerio dos Transportes e Comunicacoes
Av. 4 de Fevereiro
42-9, Luanda, Angola
Telephone: +244 2 372668

Officials
Antonio P. Kassoma, Ministro dos Transportes e Comunicaçoes
Licinio T. Ribeiro, Vice-Ministro das Comunicaçoes

Broadcasting Services
Televiso Popular de Angola
Ave Ho-Chi-Minh
CPO Box 2604
Luanda, Angola
Telephone: (1) 32 00 25 or 32 00 27
Telex: 3238

Other Recognized Operators
Empresa Nacional de Telecomunicaçoes (Enatel)
Caixa Postal 1321
Luanda, Angola
Telephone: +244 2 331032
Telex: 3030 enatel an

Empresa Publica de Telecomunicaçoes (Eptel)
Caixa Postal 625
Luanda, Angola
Telephone: +244 2 392326
Telex: 3012 eptel an
Fax: +244 2 391688

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Publica de Telecomunicacoes
Ownership: 0.101330%
Telephone: (2) 33 02 81
Telex: 991 3012
Earth station and satellites: 2 AOR
Cacuaco 1 — AOR Primary - 335.5
Cacuaco 2 — AOR Major Path 1 - 325.5 and AOR Major Path 2 - 342.0

Range of Geostationary Satellites Visible

Location	Luanda
Lat.°	8.8S
Long.°	13.2E
°Long. Differ. Visible	76°
Eastern Limit for GSO	90°E
Western Limit for GSO	297°E (63°W)

■ ANGUILLA (UNITED KINGDOM)

Status: dependent territory of the United Kingdom
Capital: The Valley
ITU abbreviation: AIA
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: NA

Demographic and Physical Information
Area: 91 km²
Population: 7,099
Major languages: English
Time zones: GMT - 4h

Telecommunications Statistics
Number of telephones: 890
Submarine cable connections: none
Radio stations: 3 AM, 1 FM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization
see United Kingdom

Broadcasting Services
Cable & Wireless (West Indies) Ltd.
P.O. Box 77
The Valley, Anguilla
Telephone: +1 809 497 3310
Telex: 9301 admin la
Telegraph: Cablewire Anguilla

Range of Geostationary Satellites Visible

Location	The Valley
Lat.°	18.2N
Long.°	63.1E
°Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	234°E (126°W)

■ ANTIGUA AND BARBUDA

Official name: Antigua and Barbuda
Capital: St. John's
ITU country abbreviation: ATG
ITU Region: 2

International telephone dialing code: 1+809 (to be changed to 268 at a future date)
International telex dialing code: 306

Demographic and Physical Information
Area: 440 km²
Population: 65,176
Major languages: English
Time zones: GMT - 4h

Telecommunications Statistics
Number of telephones: 6,700
Submarine cable connections: 1
Radio stations: 4 AM, 2 FM, 2 shortwave
Television standard: NTSC M
Electrical standard: 230 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: NA
TV households: 26,000
Cable penetration: NA (1 private network)
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization
Ministry of Public Works and Communications
The Telecommunications Officer
Saint John's Street
Saint John's, Antigua
Telephone: +1 809 4624772
Fax: +1 809 4624622

Broadcasting Services

Antigua and Barbuda Broadcasting Services
Scotts Hill
P.O. Box 1280
Saint John's, Antigua
Telephone: +1 809 462 2998
Fax: +1 809 462 1622

Other Recognized Operators

Cable and Wireless (West Indies) Ltd.
P.O. Box 65
Saint John's, Antigua
Telephone: +1 809 462 0840
Telex: 2149 ak
Fax: +1 809 462 0843

International Telecommunications Organization Membership

none

Range of Geostationary Satellites Visible

Location	St. John's
Lat.°	17.1N
Long.°	61.9E
°Long. Differ. Visible	76°
Eastern Limit for GSO	14°E
Western Limit for GSO	222°E (138°W)

ARGENTINA

Official name: Argentine Republic
Capital: Buenos Aires
ITU country abbreviation: ARG
ITU Region: 2

International telephone dialing code: 54
International telex dialing code: 390

Demographic and Physical Information

Area: 2.8 km²
Population: 34.3 million
Major languages: Spanish
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 2.65 million
Submarine cable connections: none
Radio stations: 171 AM, 0 FM, 13 shortwave
Television standard: PAL N
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 41
Television stations: 231
Television sets: NA
TV households: 6.85 million
Cable penetration: 8%
VCR penetration: 25%
Satellite Earth stations: 2 Intelsat AOR; 40 domestic

Telecommunications Regulatory Organization

Comisión Nacional de Telecomunicaciones
Sarmiento 151
Piso 4
1000 Buenos Aires, Argentina
Telephone: +54 1 3311203
Fax: +54 1 3344935

Officials

Raul José Otero, Presidente, Comisión Nacional, Telecomunicaciones
Humberto C. Garuti, Director, Comisión Nacional, Telecomunicaciones
Alfredo Raúl Parodi, Director, Comisión Nacional, Telecomunicaciones
Jorge Angel Aguirre, Director, Comisión Nacional, Telecomunicaciones
Mahamad Rodolfo Chain, Director, Comisión Nacional, Telecomunicaciones
Armando Achen, Director, Comisión Nacional, Telecomunicaciones
Graciela B. Mealla, Secretaria General, Comisión Nacional, Telecomunicaciones

Broadcasting Services

Argentina Televisora Color — Canal 7 (ATC)
Ave. Pta. Figueroa Alcorta 2977
1425 Buenos Aires, Argentina
Telephone: (1) 801 0566
Fax: (1) 802 9878 or 802 8374
Telex: 22396

Telearte — Canal 9
Gelly 3378
Buenos Aires CF, Argentina
Telephone: (1) 801 3071 or 801 3077
Fax: (1) 801 9950
Telex: 012 2132

Artear S.A. — LS85 TV — Canal 13
Lima 1261
C.P. 1147 Buenos Aires CF, Argentina
Telephone: (1) 27 38 31
Fax: (1) 331 8573
Telex: 19083

Radio Difusora El Carmen — Canal 2 La Plata
Calle 36/382
1900 La Plata
Buenos Aires, Argentina
Telephone: (1) 953 8527
Telex: 31177

Television Federal S.A. — TELEFE — Canal 11
Pavon 24444
1248 Buenos Aires DF, Argentina
Telephone: (1) 941 9231 and (1) 941 9549
Fax: (1) 942 6773
Telex: 22780

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Comision Nacional de Telecomunicaciones
Ownership: 1.160365%
Telephone: (1) 49 94 37
Fax: (1) 37 83 95
Telex: 33 18372
Earth station and satellites: 2
Balcarce — AOR Spare - 332.5
Balcarce 1 — AOR Primary - 335.5
Balcarce 2 — AOR Major Path - 342.0
Bosque Alegre — AOR Major Path 1 - 325.5
Las Lenas — AOR Major Path 2 - 342.0

Range of Geostationary Satellites Visible

Location	Buenos Aires
Lat.°	34.4N
Long.°	58.3E
°Long. Differ. Visible	74°
Eastern Limit for GSO	16°E
Western Limit for GSO	228°E (132°W)

ARMENIA

Official name: Republic of Armenia
Capital: Yerevan
ITU country abbreviation: ARM
ITU Region: 1

International telephone dialing code: 374
International telex dialing code: 0684

Demographic and Physical Information

Area: 29,800 km²
Population: 3.5 million
Major languages: Armenian, Russian
Time zones: GMT + 4h

Telecommunications Statistics

Number of telephones: 650,000
Submarine cable connections: none
Radio stations: NA
Television standard: SECAM
Electrical standard: NA
State-run television networks: NA
Private television networks: none
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministry of Communications
22 Sarian St
375-002 Yerevan, Armenia
Telephone: 885-252-6632
Fax: 885-215-1446

Officials
Arigor A. Pokhpatyan,
Minister of Communications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

European Telecommunications Satellite Organization (Eutelsat)
Investment share 0.05%

Range of Geostationary Satellites Visible

Location	Yerevan
Lat.°	40.2N
Long.°	44.5E
°Long. Differ. Visible	72°
Eastern Limit for GSO	117°E
Western Limit for GSO	332°E (28°W)

ARUBA (NETHERLANDS)

Status: self-governing territory of the Netherlands (in 1990, Aruba requested and received from the Netherlands cancellation of the agreement to automatically give independence to the island in 1996)
ITU abbreviation: ABW
ITU Region: 2

International telephone dialing code: 297
International telex dialing code: NA

Demographic and Physical Information

Area: 193 km²
Population: 65,974
Major languages: Dutch (official); Papiamento
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 72,168
Submarine cable connections: 1
Radio stations: 4 AM, 4 FM
Television standard: NTSC M
Electrical standard: 127 vac, 60 Hz (most areas)
State-run television networks: none
Private television networks: 1
Television stations: 1
Television sets: NA
TV households: 20,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: none

Broadcasting Services

Telearuba — Channel 13
Pos Chiquito 1-A
P.O. Box 392
Aruba
Telephone: 47 302 or 41 258
Fax: 41 683

Other Recognized Operators

Setar
Servicio de Telecommunicacion di Aruba
Seroe Blanco
Hendrikstraat 20-22
Oranjestad, Aruba
Telephone: +297 8 25151
Fax: +297 8 33593Telex: 5200 setar

Range of Geostationary Satellites Visible

Location	Oranjestad
Lat.°	12.5N
Long.°	70W
°Long. Differ. Visible	76°
Eastern Limit for GSO	6°E
Western Limit for GSO	214°E (146°W)

ASCENSION ISLAND (UNITED KINGDOM)

see St. Helena, under whose administration it falls

Range of Geostationary Satellites Visible

Location	Ascension
Lat.°	8.0S
Long.°	14.3E
°Long. Differ. Visible	76°
Eastern Limit for GSO	62°E
Western Limit for GSO	269°E (91°W)

AUSTRALIA

Official name: Commonwealth of Australia
Capital: Canberra
ITU country abbreviation: AUS
ITU Region: 3

International telephone dialing code: 61
International telex dialing code: 790

Demographic and Physical Information

Area: 7.7 million km²
Population: 18.3 million
Major languages: English
Time zones: GMT + 8h, GMT + 9h30m, GMT + 10h

Telecommunications Statistics

Number of telephones: 8.7 million
Submarine cable connections: 3
Radio stations: 258 AM, 67 FM
Television standard: PAL B (terrestrial), B-MAC (BSS)
Electrical standard: 240 vac, 50 Hz
State-run television networks: 2
Private television networks: 3
Television stations: 134
Television sets: NA
TV households: 5 million
Cable penetration: none
VCR penetration: 68%
Satellite Earth stations: 4 IOR, 6 POR Intelsat; many domestic

Telecommunications Regulatory Organization

Department of Transport and Communications
The Secretary
G.P.O. 594
Canberra, ACT 2601 Australia
Telephone: +61 62 747111
Fax: +61 62 746524

Australian Telecommunications Authority (AUSTEL)
Telecommunications Regulatory Agency
P.O. Box 7372
St. Kilda Road
Melbourne, VIC 3004
Telephone: 61-3828 7400
Fax: 61-3820 3021

Officials
Graham Evans, Secretary, Department of Transport and Communications
Kim Beazley, Minister for Transport and Communications

Broadcasting Services

Australian Broadcasting Corporation — ABC
GPO Box 487
Sydney NSW2001 Australia
Telephone: (2) 33 90211
Fax: (2) 950 4585/3055
Telex: 071abc 9a26889
abc aa20123

Seven Network Australia
Television Center
Mobbs Lane
Epping NSW 2121 Australia
Telephone: (2) 877 7777 Programs: (2) 877 7272
Fax: (2) 877 7888 Programs: (2) 877 7892
Telex: 145395 - AA 20250

Nine Network Australia
24 Artarmon Road
P.O. Box 27
Willoughby NSW 2068 Australia
Telephone: (2) 906 9999
Fax: (2) 958 2279 or 965 2154
Telex: AA74420

Network Ten Australia
Broadcom House
44 Bay Street
Ultimo NSW 2007 Australia
Telephone: (2) 844 1010
Fax: (2) 844 1364

Special Broadcasting Service—SBS
4 Cliff Street
Milsons Point NSW 2061 Australia
Telephone: (2) 964 2828
Fax: (2) 957 3571
Telex: 120944

Other Recognized Operators

Aussat Pty. Ltd.
GPO Box 1512
Sydney NSW 2001 Australia
Telephone: +61 2 2387800
Fax: +61 2 2387839
Telex: aussat aa26921

The Managing Director
OTC Limited
GPO Box 7000
Sydney NSW 2001 Australia
Telephone: +61 2 2875000
Fax: +61 2 2875103
+61 2 2875287
Telex: OTC aa120591

The Managing Director
Telecom Australia
Communications House
199 William Street
Melbourne, VIC. 3001 Australia
Telephone: +61 3 6065511
Fax: +61 3 6703388
+61 3 6421815
Telex: telecom aa152152

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: OTC Limited Sydney
Ownership: 2.856452%
Telephone: (2) 287 5555
Telex: 71 10165
Earth station and satellites:
Ceduna 1 (IOR major path) - 63.0
Ceduna 2 (IOR primary) - 60.0
Melbourne 1 (POR spare) - 180.0
Perth 1 (IOR primary) - 60.0
Perth 1 (IOR major path) - 63.0
Perth 2 (POR primary) - 174.0
Sydney 1 (POR spare) - 180.0
Sydney 2 (POR primary) - 174.0
Sydney 4 (POR primary) - 177.0

International Maritime Satellite Organization (Inmarsat)
Signatory: OTC Limited
Ownership: NA
Earth station: Perth (IOR and POR)

Domestic Satellite Networks

Operator: Optus Communications Pty. Ltd.
Telephone: +61 2 238-7800
Fax: +61 2 238-7100
Telex: 26921 aussat
Satellites:
Optus A1 160°E
Optus A2 156°E
Optus A3 164°E
Optus B1 NA

Range of Geostationary Satellites Visible

Location	Brisbane
Lat.°	27.5N
Long.°	78E
°Long. Differ. Visible	75°
Eastern Limit for GSO	78°E
Western Limit for GSO	228°E

Location	Canberra
Lat.°	35.3N
Long.°	149.1E
°Long. Differ. Visible	73°
Eastern Limit for GSO	76°E
Western Limit for GSO	222°E

Location	Perth
Lat.°	31.9S
Long.°	115.9°E
°Long. Differ. Visible	74°
Eastern Limit for GSO	42°E
Western Limit for GSO	190°E

Location	Sydney
Lat.°	33.9S
Long.°	151.2E
°Long. Differ. Visible	74°
Eastern Limit for GSO	77°E
Western Limit for GSO	225°E

AUSTRIA

Official name: Republic of Austria
Capital: Vienna
ITU country abbreviation: AGMT
ITU Region: 1

International telephone dialing code: 43
International telex dialing code: 047

Demographic and Physical Information

Area: 83,850 km²
Population: 8.0 million
Major languages: German
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 4 million
Submarine cable connections: none
Radio stations: 6 AM, 21 FM (545 repeaters)
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 47 (870 repeaters)
Television sets: NA
TV households: 2.5 million
Cable penetration: 22%
VCR penetration: 31%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Direction Generale des Postes et des Telegraphes
(Gentel Wien)
Postgasse 8
A-1011 Vienna, Austria
Telephone: 1 515-51-0
Fax: 1 512-8414

Officials
Josef Sindelka, Director General

Broadcasting Services

Oesterreichischer Rundfunk—ORF
ORF Center
Wurzburggasse 30
A-1136 Vienna, Austria
Telephone: 1 87878
Fax: 1 87878 2550
Telex: 133601

Other Recognized Operators
Radio-Austria A.G.
Wiedner Hauptstrasse 73
A-1042 Wien, Austria
Telephone: 1 50145-0
Fax: 50260
Telex: 047-114731 / 114732 ra a

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Gentel Wien
Ownership: 0.490389%
Telephone: 222 587 0698
Fax: 222 587 1903
Telex: 47 10999 serv a
Earth station and satellites:
Anflenz 1 — AOR Primary - 335.5
Anflenz 2 — IOR Primary - 60.0

European Telecommunications Satellite Organization (Eutelsat)
Signatory: Administration Autrichienne des Postes et Telegraphs
Investment share: 2.20823%

Range of Geostationary Satellites Visible

Location	Vienna
Lat.°	48.2N
Long.°	16.4E
°Long. Differ. Visible	70°
Eastern Limit for GSO	86°E
Western Limit for GSO	307°E (53°W)

■ AZERBAIJAN

Official name: Azerbaijani Republic
Capital: Baku
ITU country abbreviation: AZE
ITU Region: 1

International telephone dialing code: 994
International telex dialing code: 0784

Demographic and Physical Information
Area: 86,600 km²
Population: 7.8 million
Major languages: Azeri (official), Russian
Time zones: GMT + 3h30m

Telecommunications Statistics
Number of telephones: 710,000
Submarine cable connections: none
Radio stations: NA
Television standard: SECAM
Electrical standard: 220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization
Ministry of Communications
Pr. Azerbaijana 33
370-139 Baku, Azerbaijan
Telephone: 892-930-004
Telex: 0784-142105

Official
Mr. S. Abbasbeily,
Minister of Communication

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat)

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Baku
Lat.°	40.4N
Long.°	49.7E
°Long. Differ. Visible	72°
Eastern Limit for GSO	122°E
Western Limit for GSO	337°E (22°W)

■ AZORES ISLANDS (PORTUGAL)

Range of Geostationary Satellites Visible

Location	Azores
Lat.°	38.7N
Long.°	29E
°Long. Differ. Visible	73°
Eastern Limit for GSO	44°E
Western Limit for GSO	258°E (102°W)

■ THE BAHAMAS

Official name: Commonwealth of the Bahamas
Capital: Nassau
ITU country abbreviation: BAH
ITU Region: 2

International telephone dialing code: 1+809
(to be changed to 242 beginning 10/1/96)
International telex dialing code: 382

Demographic and Physical Information
Area: 13,940 km²
Population: 256,616
Major languages: English
Time zones: GMT - 5h

Telecommunications Statistics
Number of telephones: 99,000
Submarine cable connections: 3
Radio stations: 3 AM, 2 FM
Television standard: NTSC M
Electrical standard: 120 vac, 60Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 57,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization
Ministry of Consumer Affairs
The Permanent Secretary
P.O. Box N 8347
1 Nassau, Bahamas
Telephone: +1 809 322-6317
Fax: +1 809 322-7249

Officials
Roosevelt Butler, Permanent Secretary, Ministry of Consumer Affairs
Vincent Peet, Minister of Consumer Affairs

Broadcasting Services
Broadcasting Corporation of the Bahamas,
Channel 13
P.O. Box N 1347
Nassau, Bahamas

Other Recognized Operators
General Manager
Bahamas Telecommunications Corporation
(BATELCO)
John F. Kennedy Drive
P.O. Box N 3048
Nassau, Bahamas
Telephone: +1 809 323 4911
Fax: +1 809 326-7474 or +1 809 326-0880
Telex: 20135 batelco

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Batelco Nassau
Ownership: 0.100558%
Telephone: (1) (809) 324-7690
Fax: (1) (809) 324-7399
Telex: 20135
Earth station and satellites:
New Providence 1 — AOR Major Path 2 - 342.0

Range of Geostationary Satellites Visible

Location	Nassau
Lat.°	25.1N
Long.°	77.3E
° Long. Differ. Visible	75°
Eastern Limit for GSO	358°E (2°W)
Western Limit for GSO	208°E (152°W)

■ BAHRAIN

Official name: State of Bahrain
Capital: Manama
ITU country abbreviation: BHR
ITU Region: 1

International telephone dialing code: 973
International telex dialing code: 0490

Demographic and Physical Information

Area: 620 km²
Population: 575,925
Major languages: Arabic (official), English, Farsi, Urdu
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 98,000
Submarine cable connections: 2
Radio stations: 2 AM, 3 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 230 vac, 50 Hz and some 110 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: 21 million
TV households: 145,000
Cable penetration: none
VCR penetration: 72%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR, 1 Arabsat

Telecommunications Regulatory Organization

Chief of Telecomms
Ministry of Transportation
Telecomms Office, P.O. Box 11170
Manama, Bahrain

Officials
Shaikh Ali Binkhalifa Bin Salman Al-Khalifa, Minister of Transportation
Rasheed Jassim Ashoor, Chief of Telecomms

Telecommunications Operator

Bahrain Telecommunications Company (BATELCO)
P.O. Box 14
Manama, Bahrain
Telephone: 88 18 81
Fax: 88 34 51
Telex: 0490-8205 btctcc bn

Broadcasting Services

Assistant Under Secretary for Radio and TV
Ministry of Information
Isa Town, Bahrain
Telephone: 68 90 22
Telex: 0490 681544
Fax: 681544

Bahrain Television — Channel 55
P.O. Box 1075
Isa Town, Bahrain
Telephone: +973 78 18 88
Fax: +973 68 15 44
Telex: 8311 BN

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): Investment share: 2.45%

International Telecommunication Union (ITU)

International Maritime Satellite Organization (Inmarsat)
Signatory: Batelco Bahrain
Ownership: 0.079%
Telephone: 88 35 35
Fax: 27 44 58
Telex: 0490 8205
Earth station and satellites:
Ras Abu Jarjur 1 — AOR Major Path 2 - 342.0
Ras Abu Jarjur 2 — IOR Primary - 60.0

Range of Geostationary Satellites Visible

Location	Manama
Lat.°	26.2N
Long.°	50.5E
° Long. Differ. Visible	75°
Eastern Limit for GSO	126°E
Western Limit for GSO	336°E (24°W)

■ BAKER ISLANDS (UNITED STATES)

Range of Geostationary Satellites Visible

Location	Baker Island
Lat.°	0.2N
Long.°	176.6W
° Long. Differ. Visible	77°
Eastern Limit for GSO	260°E (100°W)
Western Limit for GSO	106°E

■ BALAERIC ISLANDS

see Mallorca and Minorca

■ BANGLADESH

Official name: People's Republic of Bangladesh
Capital: Dhaka
ITU country abbreviation: BGD
ITU Region: 1

International telephone dialing code: 880
International telex dialing code: 950

Demographic and Physical Information

Area: 144,000 km²
Population: 118.4 million
Major languages: Bangla (official); English
Time zones: GMT + 6h

Telecommunications Statistics

Number of telephones: 182,000
Submarine cable connections: none
Radio stations: 9 AM, 6 FM
Television standard: PAL B
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 11
Television sets: NA
TV households: 400,000
Cable penetration: none
VCR penetration: 5%
Satellite Earth stations: 2 Intelsat IOR

Telecommunications Regulatory Organization

Bangladesh Telegraph and Telephone Board
Telejogajog Bhaban
36/1, Mymensing Road
DHAKA-1000, Bangladesh
Telephone: +880 2 831500
+880 2 407800
Telex: 0780 642020
b#b bj/642030
Fax: 880 2 832 577
880 2 833 003

Officials
Janab F.Q.M. Farooq, Director (International)
Mohammad Shamsul Islam, State Minister for Post and Telecommunications
Fazlur Rahman, Chairman, Bangladesh Telegraph and Telephone

Broadcasting Services

Bangladesh Television — BTV
National Broadcasting Authority (TV Wing)
N.B.A. Bhaban
121 Kazi Nazrul Islam Avenue
Dhaka, Bangladesh
Telephone: (2) 880 2 503342
Fax: (2) 83 29 27
Telex: 0780 65624 btubj

Official
Janab Saiful Bari, Chairman, National Broadcasting Authority

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
International Telecommunications Satellite Organization (Intelsat)
Signatory: Telegraph and Telephone Board of Bangladesh
Teleboard Dacca
Ownership: 0.215680%
Telephone: (2) 83 42 72
Telex: (2) 780 642027
Earth station and satellite:
Betbunia — IOR Primary - 60.0
Talibabad — IOR Primary - 60.0

Range of Geostationary Satellites Visible

Location	Dhaka
Lat.°	24.4N
Long.°	90.4E
°Long. Differ. Visible	75°
Eastern Limit for GSO	165°E
Western Limit for GSO	15°E

BARBADOS

Official name: Barbados
Capital: Bridgetown
ITU country abbreviation: BRB
ITU Region: 2

International telephone dialing code: 1+809
(to be changed to 246 beginning 7/1/96)
International telex dialing code: 386

Demographic and Physical Information

Area: 430 km²
Population: 256,395
Major languages: English
Time zones: GMT - 3h

Telecommunications Statistics

Number of telephones: 89,000
Submarine cable connections: none
Radio stations: 3 AM, 2 FM
Television standard: NTSC M
Electrical standard: 115 vac, 50Hz
State-run television networks: 1
Private television networks: 4
Television stations: 2 (1 pay)
Television sets: NA
TV households: 60,000
Cable penetration: none
VCR penetration: 23%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministry of Public Works, Communications and Transportation
Herbert House, Fontabelle
Saint Michael
Bridgetown, Barbados
Telephone: +1 809 4262669
Fax: +1 809 4310121

Officials
Harcourt Williams, Permanent Secretary, Telecommunications Division

Broadcasting Services

Carribean Broadcasting Corporation — Channel 9
Pine Hill, Saint Michael
P.O. Box 900
Bridgetown, Barbados
Telephone: 429 2041
Fax: 429 4795
Telex: 2560

Other Recognized Operators

Barbados External Telecommunications Ltd.
P.O. Box 32
Bridgetown, Barbados
Telephone: +1 809 4275200
Telex: 2262 adminbar wb

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Barbados External Communications Ltd.
Cable Wireless Bridgetown
Ownership: 0.05000%
Telephone: 427 5200 or 1 809 297 7144
Fax: 1 809 292 2186
Telex: 2232
Earth station and satellites:
Barbados — AOR Major Path 1 - 325.5

Range of Geostationary Satellites Visible

Location	Bridgetown
Lat.°	13.1N
Long.°	59.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	17°E
Western Limit for GSO	224°E (136°W)

BARBUDA

see Antigua and Barbuda

Range of Geostationary Satellites Visible

Location	Barbuda
Lat.°	17.5N
Long.°	61.7W
°Long. Differ. Visible	76°
Eastern Limit for GSO	14°E
Western Limit for GSO	223°E (137°W)

BELARUS

Official name: Republic of Belarus
Capital: Minsk
ITU country abbreviation: BLR
ITU Region: 1

International telephone dialing code: 375
International telex dialing code: 681

Demographic and Physical Information

Area: 207,600 km²
Population: 10.4 million
Major languages: Byelorussian (official), Russian, Polish
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 1.85 million
Submarine cable connections: none
Radio stations: NA

Television standard: SECAM
Electrical standard: 220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: 3.5 million
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: Intelsat and Eutelsat

Telecommunications Regulatory Organization

Ministry of Posts and Communications
Minsk, Belarus
Telephone: 0172 222-157
Fax: 0172 260-848

Officials

I.M. Gritsouk, Minister of Posts and Telecommunications

International Telecommunications Organization Membership

none

Range of Geostationary Satellites Visible

Location	Minsk
Lat.°	53.9N
Long.°	27.5E
°Long. Differ. Visible	67°
Eastern Limit for GSO	95°E
Western Limit for GSO	320°E (39°W)

■ BELAU

see Pelau

■ BELGIUM

Official name: Kingdom of Belgium
Capital: Brussels
ITU country abbreviation: BEL
ITU Region: 1

International telephone dialing code: 32
International telex dialing code: 846

Demographic and Physical Information

Area: 30,510 km²
Population: 10.0 million
Major languages: Flemish (Dutch), French
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 4.7 million
Submarine cable connections: 5
Radio stations: 3 AM, 39 FM
Television standard: VHF: PAL B; UHF: PAL H
Electrical standard: 220 vac, 50 Hz
State-run television networks: 2
Private television networks: 4
Television stations: 32
Television sets: NA
TV households: 3.6 million
Cable penetration: 92%
VCR penetration: 45%
Satellite Earth stations: 2 Intelsat AOR, 1 Eutelsat

Telecommunications Regulatory Organization

Ministére des Cinnybucatuibs et del'Infrastructure
Service des Agréments de Télécommunication
Rue Van Orley 5
B-1000 Bruxelles, Belgium
Telephone: 2-223-0800
Fax: 2-223-1128

Telecommunications Operator

Belgacom
Comité de Direction
Bd. Emile Jacqmain 151
B-1210 Bruxelles, Belgium
Telephone: 2-202-8111
Telex: 046 291 54 gentl b
Fax: 2-217-9966

Official

Ledewijk Eggermont, Administrative Director

Broadcasting Services

Belgische Radio en Televisie — BRT
Omroepcentrum
Auguste Reyerslaan 52, B
B-1043 Brussels, Belgium
Telephone: 2-741 3111
Fax: 2- 734 9351
Telex: 046-21719

Radiodiffusion Television Belge de la
Communaute Francaise — RTBF
Boulevard Auguste Reyers 52
B-1044 Brussels, Belgium
Telephone: 2-741 2111
Fax: 2-741 4357
General: 2-733 4020
Telex: 046-63132

RTL — TVI
67 Avenue Franklin Roosevelt
B-1051 Brussels, Belgium
Telephone: 2-627 1711
Fax: 2-627 1712
Telex: 64330

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 2.62333%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Regie des Telegraphes et des Telephones
Transgen Brussels
Ownership: 0.77604%
Telephone: 2-513 5274
Telex: 46 29126
Earth station and satellites:
Belgium TVRO — AOR Spare - 332.5
Lessive 1 — AOR Primary - 335.5
Lessive 2 — AOR Major Path 2 - 342.0

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: 0.705%
Earth station: none

Range of Geostationary Satellites Visible

Location	Brussels
Lat.°	50.9N
Long.°	4.4E
°Long. Differ. Visible	68°
Eastern Limit for GSO	72°E
Western Limit for GSO	296°E (64°W)

■ BELIZE

Official name: Belize
Capital: Belmopan
ITU country abbreviation: BLZ
ITU Region: 2

International telephone dialing code: 501
International telex dialing code: 310

Demographic and Physical Information

Area: 22,960 km²
Population: 214,061
Major languages: English (official), Spanish, Maya
Time zones: GMT - 6h

Telecommunications Statistics

Number of telephones: 8,650
Submarine cable connections: none
Radio stations: 6 AM, 5 FM
Television standard: monochrome
Electrical standard: 110 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: 12%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministry of Foreign Affairs
Independence Hill
Belmopan, Belize

Broadcasting Services

Belize Broadcasting Authority
Regent Street
Belize City, Belize
Telephone: (2) 77 112

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
Signatory: Telecom Ltd.
Telephone: (2) 77 085
Telex: 371223
Earth station and satellites:
Belmopan 2 — AOR Major Path 2 - 341.5

Range of Geostationary Satellites Visible

Location	Belmopan
Lat.°	17.3N
Long.°	88.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	347°E (13°W)
Western Limit for GSO	195°E (165°W)

BENIN

Official name: Republic of Benin
Capital: Porto-Novo
ITU country abbreviation: BEN
ITU Region: 1

International telephone dialing code: 229
International telex dialing code: 979

Demographic and Physical Information

Area: 112,620 km²
Population: 5.5 million
Major languages: French (official); Fon, Yoruba
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 2 AM, 2 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: NA
TV households: 17,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

L'Office des Postes et des Telecommunications
Monsieur le Directeur General
Cotonou, Benin
Telephone: +229 312045
Fax: +229 313843

Officials

Toussaint Tchitchi, Ministre

Broadcasting Services

Television du Benin
P.O. Box 366
Cotonou, Benin
Telephone: 30 10 96 or 30 06 28
Telex: 5132

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Office des Postes et Telecommunications Ofipostel Ctnou
Ownership: 0.050000%
Telephone: 31 22 10
Telex: 5325
Earth station and satellites:
Abomey-Calavi — AOR Primary - 335.5

Range of Geostationary Satellites Visible

Location	Porto-Novo
Lat.°	6.4N
Long.°	2.7W
°Long. Differ. Visible	76°
Eastern Limit for GSO	79°E
Western Limit for GSO	286°E (74°W)

BERMUDA (UNITED KINGDOM)

Status: dependent territory of the United Kingdom
Capital: Hamilton
ITU abbreviation: BER
ITU Region: 1

International telephone dialing code: 441
International telex dialing code: NA

Demographic and Physical Information

Area: 50 km²
Population: 61,629
Major languages: English
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 52,670
Submarine cable connections: 3
Radio stations: 5 AM, 3 FM
Television standard: NTSC M
Electrical standard: 120 vac, 60Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: NA
TV households: 28,000
Cable penetration: 14%
VCR penetration: 70%
Satellite Earth stations: 2 Intelsat AOR

Broadcasting Services

Bermuda Broadcasting Company Ltd. — ZFB TV-7, ZBM TV-9
P.O. Box HM 452
Hamilton HM BX, Bermuda
Telephone: 295 2828
Fax: 295 4282 or 292 5704 (Newsroom Fax)

Other Recognized Operators

Cable and Wireless PLC
P.O. Box 151
Church Street West
Hamilton 5, Bermuda
Telephone: +1 809 295 4777
Telex: 3210 cweng ba or 3222 cw admin ba

The Bermuda Telephone Company Ltd.
P.O. Box HM 1021
30 Victoria Street
Hamilton HM DX, Bermuda
Telephone: +1 809 295 1001
Fax: +1 809 292 1192
Telex; 3682 ba

Signatory: Cablewire Bermuda
Telephone: 809 295 4377
Telex: 3310
Earth station and satellites:
Devonshire 1 — AOR Major Path 1 - 325.5
Devonshire 2 — AOR Major Path 2 - 342.0

Range of Geostationary Satellites Visible

Location	Hamilton
Lat.°	32.8N
Long.°	65W
°Long. Differ. Visible	74°
Eastern Limit for GSO	9°E
Western Limit for GSO	221°E(139°W)

BHUTAN

Official name: Kingdom of Bhutan
Capital: Thimphu
ITU country abbreviation: BTN
ITU Region: 1

International telephone dialing code: 975
International telex dialing code: NA

Demographic and Physical Information
Area: 47,000 km²
Population: 1.78 million
Major languages: Dzongkha (official); Tibetan and Nepalese dialects
Time zones: GMT + 5h30m

Telecommunications Statistics
Number of telephones: NA
Submarine cable connections: none
Radio stations: 1 AM, 1 FM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: none

Telecommunications Regulatory Organization
Ministry of Communications and Tourism
Department of Posts and Telegraphs
The Director General
Thimphu; Bhutan
2296

Officials
Dasho K. Letho, Secretary, Ministry of Communications
Dasho Gasey Lhendup, Director General, Department of Posts

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Timphu
Lat.°	27.5N
Long.°	89.8E
°Long. Differ. Visible	75°
Eastern Limit for GSO	165°E
Western Limit for GSO	15°E

BOLIVIA

Official name: Republic of Bolivia
Capital: La Paz (seat of government); Sucre (legal capital and seat of judiciary)
ITU country abbreviation: BOL
ITU Region: 2

International telephone dialing code: 591
International telex dialing code: 355, 356

Demographic and Physical Information
Area: 1.1 million km²
Population: 7.89 million
Major languages: Spanish, Quechua, Aymara
Time zones: GMT - 4h

Telecommunications Statistics
Number of telephones: 150,000
Submarine cable connections: none
Radio stations: 129 AM, 0 FM, 68 shortwave
Television standard: NTSC M
Electrical standard: 115 vac, 220 vac, and 230 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 43
Television sets: NA
TV households: 500,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization
Direccion General de Telecomunicaciones
Cajon Postal 4475
Calle Mercado, No. 1115
Edif. Guerrero
5, La Paz, Bolivia
Telephone: +591 2 368788

Officials
Hector Guzman Hinojosa, Director General de Telecomunicaciones
Willy Vargas Vacaflor, Ministro de Transportes y Comunicaciones
Carlos Zamorano Jordan, Subsecretario de Comunicaciones

Broadcasting Services
Canal 7 — Empresa Nacionale de Television Boliviana — ENTS
Calle Ayacucho 467
Casilla 900
La Paz, Bolivia
Telephone: (2) 37 63 68 or 37 63 56/7
Fax: (2) 35 22 79
Telex: 2312

Illimani de Comunicaciones S.A.
ATB Red Nacional — Canal 9
Ave. 6 de Agosto 2972
La Paz, Bolivia
Telephone: (2) 36 57 48
Fax: (2) 36 99 97
Telex: 3342

Canal 6 — America TV
Edificio Batallon, P.B.
Calle Batallon Colorados
162 La Paz, Bolivia
Telephone: (2) 37 63 47/8/9
Fax: (2) 39 20 35
Programs: (2) 37 14 75
Telex: 2531

Other Recognized Operators
Empresa Nacional de Telecomunicaciones (Entel)
Edificio Entel - Ayacucho s/n
Casilla Postal 4450
La Paz, Bolivia
Telephone: +591 2 355908
Telex: 3507 entget bv

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Nacional de Telecomunicaciones
Entel, Bolivia
Ownership: 0.158412%
Telephone: (2) 37 40 65
Telex: 309 3209
Earth station and satellites:
Tiwanaku — AOR Primary - 335.5

Range of Geostationary Satellites Visible

Location	La Paz
Lat.°	15.5S
Long.°	68W
°Long. Differ. Visible	76°
Eastern Limit for GSO	8°E
Western Limit for GSO	216°E (144°W)

BONAIRE (NETHERLANDS)

see Netherlands Antilles

Range of Geostationary Satellites Visible

Location	Bonaire
Lat.°	12.2N
Long.°	68.3W
°Long. Differ. Visible	76°
Eastern Limit for GSO	8°E
Western Limit for GSO	215°E (145°W)

BORNEO

see Brunei, Indonesia, and Malaysia

■ BOSNIA-HERZEGOVINA

Official name: Republic of Bosnia-Herzegovina
Capital: Sarajevo
ITU country abbreviation: BIH
ITU Region: 1

International telephone dialing code: 387
International telex dialing code: 002

Demographic and Physical Information

Area: 51,233 km²
Population: 3.2 million
Major languages: Serbo-Croatian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 727,000
Submarine cable connections: NA
Radio stations: 9 AM, 2 FM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 6
Television sets: 1.0 million
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization

Ministry of Traffic and Communications
Bosnia-Herzegovina
Gajev trg 4/1
71000 Sarajevo
Telephone: +387 71 663 949
Fax: +387 71 440 602

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Sarajevo
Lat.°	43.9N
Long.°	18.4W
° Long. Differ. Visible	71°
Eastern Limit for GSO	90°E
Western Limit for GSO	307°E(53°W)

■ BOTSWANA

Official name: Republic of Botswana
Capital: Gaborone
ITU country abbreviation: BOT
ITU Region: 1

International telephone dialing code: 267
International telex dialing code: NA

Demographic and Physical Information

Area: 600,370 km²
Population: 1.39 million
Major languages: English (official), Setswana
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 26,000
Submarine cable connections: none
Radio stations: 7 AM, 13 FM
Television standard: PAL I
Electrical standard: 231 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Botswana Telecommunications Corporation (BTC)
The Chief Executive
Khama Crescent
P.O. Box 700
Gaborone, Botswana
Telephone: +267 358000
Fax: +267 313355

Officials
D.G. Clark, Chief Executive, BTC

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Gaborone
Lat.°	24.8S
Long.°	25.9E
° Long. Differ. Visible	75°
Eastern Limit for GSO	101°E
Western Limit for GSO	311°E (49°W)

■ BRAZIL

Official name: Federative Republic of Brazil
Capital: Brasília
ITU country abbreviation: B
ITU Region: 2

International telephone dialing code: 55
International telex dialing code: 391

Demographic and Physical Information

Area: 8.5 million km²
Population: 160.7 million
Major languages: Portugese (official); Spanish, English, French
Time zones: GMT - 3h

Telecommunications Statistics

Number of telephones: 9.86 million
Submarine cable connections: 3
Radio stations: 1,223 AM, 0 FM, 151 shortwave
Television standard: PAL M
Electrical standard: 127 vac and 220 vac, 60 Hz
State-run television networks: 1
Private television networks: >150
Television stations: 112
Television sets: NA
TV households: 38.5 million
Cable penetration: NA
VCR penetration: 16%
Satellite Earth stations: 3 Intelsat AOR

Telecommunications Regulatory Organization

Departamento Nacional de Servicos Privados
Secretaria Nacional das Comunicacoes
Ministerio da Infra-Estrutura
Bloco R, Ed. Anexo
3° Andar
70044-Brasilia, DF, Brazil
Telephone: +55 61 2186811
Fax: +55 61 2234992

Officials
Joâo Eduardo Cerdeira de Santana, Ministro de Estado da Infra-Estrutura
Joel Rauber, Secretário Nacional das Comuniçôes
Roberto Blois, Director, Departmento Nacional de Servicios Privados

Broadcasting Services

Rede Globo de Televisao
Rua Lopes Quintas, 303
22460 Rio de Janeiro, Brazil
Telephone: (21) 529 2000
Fax: (21) 294 2042
Telex: 2122795/23131

Rede Manchete
Rua do Russel 804
Flamengo
22210 Rio de Janeiro, Brazil
Telephone: (21) 285 0033
Fax: (21) 205 4999 or 205 9998
Telex: 2121525

Rede Bandeirantes
Rua Radiantes, 13
CEP 05699 Sao Paulo, Brazil
Telephone: (11) 845 7211
Fax: (11) 843 1885 (Programs)
Telex: 1181680 RTBA BR

Sistema Brasileiro de Televisao — SBT
Rua Dona Santa Veloso
575 Vila Guilherme
02050 Sao Paulo, Brazil
Telephone: (11) 706 3497
Fax: (11) 706 0303 or 706 1607
Telex: 1172056 or 1172057

TV Cultura — Fundacao Padre Anchieta
P.O. Box 11 544
05090 Sao Paulo, Brazil
Telephone: (11) 263 9111
Fax: (11) 864 3926
Telex: 1182055

Funteve — Rede Brasil
Rua da Imprensa
16/9 Castelo
20231 Rio de Janeiro, Brazil
Telephone: (21) 252 8439
Telex: 2122785

TV Record
Ave Miruna
173 Aeroporto - 04085
Sao Paulo, Brazil
Telephone: (11) 542 9000
Telex: 22245

TV Gaucha — Rede Brasil Sul
Rua TV Gaucha 189
Porto Alegre
Rio Grande Do Sul, Brazil
Telephone: (512) 33 62 11 or 23 11 00
Telex: 5121100 or 4118

TV Gazeta
Ave Paulista, 900
Sao Paulo 01310 Brazil
Telephone: (11) 287 4322
Fax: (11) 284 4742
Telex: 1135914, 39444

Globosat
Rua Itapiru, 1209
Rio de Janeiro, Brazil
Telephone: (21) 502 3535
Fax: (21) 293 4311
Telex: 31752

Other Recognized Operators

Empresa Brasileira de Telecomunicacoes S.A. (Embratel)
Avenida Presidente Vargas 1012
15° andar
20071 - Rio de Janeiro, RJ, Brazil
Telephone: +55 21 2331144
Fax: +55 21 2337399
Telex: 2121810 ebtl br

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Brasileira de Telecomunicacoes S.A. (Embratel)
Ownership: 1.799024%
Telephone: (21) 216 7661
Fax: (21) 233 7399
Telex: 38 2121315
Earth station and satellites:
Morungaba — AOR Major Path 2 - 342.0
Tangua 1 — AOR Primary - 335.5
Tangua 2 — AOR Major Path - 325.5
Tangua 3 — AOR Spare - 307.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Empresa Brasileira de Telecomunicacoes S.A. (Embratel)
Ownership: NA
Earth station: none

Domestic Satellite Network

Operator: Sistema Brasileiro de Telecomunicacoes por Satelite (SBTS, Brazilsat), an agency of Empresa Brasileira de Telecomunicacoes S.A. (EMBRATEL)
Telephone: +55 21 216-7440
Fax: +55 21 233-0195
Telex: 55 21 9922021
Satellites:

Brazilsat A1	295°E (65°W)
Brazilsat A2	290°E (70°W)

Range of Geostationary Satellites Visible

Location	Rio de Janeiro
Lat.°	23S
Long.°	43.2W
° Long. Differ. Visible	75°
Eastern Limit for GSO	32°E
Western Limit for GSO	235°E (125°W)

Location	Porto Allegre
Lat.°	30.1S
Long.°	51.2W
° Long. Differ. Visible	74°
Eastern Limit for GSO	23°E
Western Limit for GSO	235°E (125°W)

■ BRITISH VIRGIN ISLAND (UNITED KINGDOM)

Status: dependent territory of the United Kingdom
Capital: Road Town
ITU abbreviation: VRG
ITU Region: 2

International telephone dialing code: 1+809 (to be changed to 284 at a future date)
International telex dialing code: NA

Demographic and Physical Information

Area: 150 km^2 (total of all islands)
Population: 13,027 (total of all islands)
Major languages: English
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 3,000
Submarine cable connections: 1
Radio stations: 1 AM
Television standard: NTSC M
Electrical standard: NA
State-run television networks: none
Private television networks: 1
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization

The Postmaster
General Post Office
Road Town, Tortola
British West Indies
Telephone: +1 809 43701

Broadcasting Services

Virgin Islands Broadcasting Corporation
Baughers Bay
Box 78
Road Town, Tortola, British Virgin Islands
Telephone: +1 809 42250

Other Recognized Operators

Cable and Wireless (West Indies) Ltd.
P.O. Box 440
Road Town, Tortola, British West Indies
Telephone: +1 809 494-4444
Telex: 7953 cwmrg vb

Range of Geostationary Satellites Visible

Location	Tortola
Lat.°	18.3N
Long.°	64.8W
°Long. Differ. Visible	76°
Eastern Limit for GSO	11°E
Western Limit for GSO	220°E (140°W)

■ BRUNEI

Official name: Negara Brunei Darussalam
Capital: Bandar Seri Begawan
ITU country abbreviation: BRU
ITU Region: 3

International telephone dialing code: 673
International telex dialing code: 673

Demographic and Physical Information
Area: 5,770 km²
Population: 292,266
Major languages: Malay (official), English, Chinese
Time zones: GMT + 8h

Telecommunications Statistics
Number of telephones: 33,000
Submarine cable connections: NA
Radio stations: 4 AM, 4 FM
Television standard: PAL B
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 67,000
Cable penetration: none
VCR penetration: 60%
Satellite Earth stations: 1 Intelsat IOR, 1 Intelsat POR

Telecommunications Regulatory Organization
Telecommunications Department
Director of Telecommunications
Bandar Seri Begawan, Brunei
Telephone: 2 242324
Fax: 2 220445

Officials
Dato Haji Abdullah bin Mudim Haji, Director of Telecommunications

Broadcasting Services
Radio Television Brunei — RTB
Bandar Seri Begawan 2042
Darussalam, Brunei
Telephone: (2) 43 111
Fax: (2) 41 882
Telex: 2311 or 2720

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Bandar
Lat.°	4.9N
Long.°	115E
°Long. Differ. Visible	76°
Eastern Limit for GSO	191°E
Western Limit for GSO	39°E

■ BULGARIA

Official name: Republic of Bulgaria
Capital: Sofia
ITU country abbreviation: BUL
ITU Region: 1

International telephone dialing code: 359
International telex dialing code: 865

Demographic and Physical Information
Area: 110,910 km²
Population: 8.77 million
Major languages: Bulgarian
Time zones: GMT + 2h

Telecommunications Statistics
Number of telephones: 2.6 million
Submarine cable connections: none
Radio stations: 20 AM, 15 FM
Television standard: VHF: SECAM D; UHF: SECAM K
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 29
Television sets: 2.1 million
TV households: NA
Cable penetration: <1%
VCR penetration: 9%
Satellite Earth stations: 1 Intersputnik; (Intelsat connection through Greek Earth station)

Telecommunications Regulatory Organization
Comite des Postes, des Telecommunications et de l'Informatique
P.O. Box 1352
rue Gourko 6
1000 Sofia, Bulgaria
Telephone: 2 885792
Telex: 067-22846
Fax: 2 803871

Officials
Stefan Antonov Sofiyanski, President of the Committee of Telecommunications and Information.

Broadcasting Services
Bulgarian TV — BT
Boulevard Dragan Tzankov 4
1040 Sofia, Bulgaria
Telephone: 2- 66 52 69 or 65 30 97
Fax: 2- 66 23 88
Telex: 067- 22581

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: 0.168%
Earth station: none

International Organization of Space Communications (Intersputnik)

Range of Geostationary Satellites Visible

Location	Sofia
Lat.°	42.8N
Long.°	23.3E
°Long. Differ. Visible	71°
Eastern Limit for GSO	95°E
Western Limit for GSO	312°E (48°W)

■ BURKINA FASO

Official name: Burkina Faso
Capital: Ouagadougou
ITU country abbreviation: BFA
ITU Region: 1

International telephone dialing code: 226
International telex dialing code: 985

Demographic and Physical Information
Area: 274,200 km²
Population: 10.43 million
Major languages: French (official); Sudanic tribal languages
Time zones: GMT

Telecommunications Statistics
Number of telephones: NA
Submarine cable connections: NA
Radio stations: 2 AM, 1 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: NA
TV households: 45,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministere de l'Equipement, des Transports et des Communications
Ouagadougou, Burkina Faso
Telephone: +226 332756

Officials

Pierre Josph Tapsoba, Minister

Broadcasting Services

Television Nationale du Burkina
29 Boulevard de la Revolution
B.P. 2530
Ouagadougou, Burkina Faso
Telephone: 30 66 27 or 30 66 24
Telex: 5327

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Office des Postes et Telecommunications
Dirpostel
Ownership: 0.068010%
Telephone: 33 50 60
Telex: 978 5200
Earth station and satellites:
Somgande — AOR Major Path 1 - 325.5

Range of Geostationary Satellites Visible

Location	Ouagadougou
Lat.°	12.4N
Long.°	1.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	74°E
Western Limit for GSO	282°E (78°W)

BURMA

see Myanmar

BURUNDI

Official name: Republic of Burundi
Capital: Bujumbura
ITU country abbreviation: BDI
ITU Region: 1

International telephone dialing code: 257
International telex dialing code: 977

Demographic and Physical Information

Area: 27,830 km²
Population: 6.2 million
Major languages: Kirundi and French (both official); Swahili
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 8,000
Submarine cable connections: none
Radio stations: 2 AM, 2 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 100,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministere des Transports, Postes et Telecommunications
B.P. 2000
Bujumbura, Burundi
Telephone: +257 22 2923

Officials

Simon Rusuku E.

Broadcasting Services

Television Nationale du Burundi
P.O. Box 1900
Bujumbura, Burundi
Telephone: (2) 24 760
Telex: 5119

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
Signatory: Onatel
Telephone: 25 800 or 22 54 20
Fax: 22 69 17
Telex: 903 5100
Earth station and satellites:
Bujumbura — IOR Primary - 60.0

Range of Geostationary Satellites Visible

Location	Bujumbura
Lat.°	3.3S
Long.°	29.3E
°Long. Differ. Visible	76°
Eastern Limit for GSO	106°E
Western Limit for GSO	313°E (47°W)

CAMBODIA

Official name: Kingdom of Cambodia
Capital: Phnom Penh
ITU country abbreviation: CBG
ITU Region: 3

International telephone dialing code: NA
International telex dialing code: NA

Demographic and Physical Information

Area: 181,040 km²
Population: 10.5 million
Major languages: Khmer (official); French
Time zones: GMT + 7h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 1 AM
Television standard: none
Electrical standard: 120 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 55,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

NA; see representative in Thailand, below

Officials

M. le Vice-President du Cambodge
chargé des affaires d'etrangères
c/o Mission Permanente de Cambodge
auprès de l'ESCAP
486 Thetsabarn Nimit Nua Road
Lard Yao, Bangkhen
Bangkog 9, Thailand

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Phnom Penh
Lat.°	11.5N
Long.°	104.9E
°Long. Differ. Visible	76°
Eastern Limit for GSO	181°E
Western Limit for GSO	29°E

CAMEROON

Official name: Republic of Cameroon
Capital: Yaoundé
ITU country abbreviation: CME
ITU Region: 1

International telephone dialing code: 237
International telex dialing code: 978

Demographic and Physical Information

Area: 475,440 km²
Population: 13.5 million
Major languages: English and French (both official)
Time zones: GMT +1h

Telecommunications Statistics

Number of telephones: 26,000
Submarine cable connections: none
Radio stations: 11 AM, 11 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 127, 220, and 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 10,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Ministere des Postes et des Telecommunications
Yaounde, Cameroon
Telephone: +237 23 2055

Officials

Sanda Oumarou, Minister of Posts and Telecommunications

Broadcasting Services

National Television Corporation
P.O. Box 1634
Yaounde, Cameroon
Telephone: 23 40 88 or 22 17 98
Fax: 20 43 40
Telex: 8888

Other Recognized Operators

Société des Télécommunications Internationales du Cameroun (Intelcam)
Boite Postal 1571
Yaounde, Cameroon
Telephone: +257 23 4065
Telex: intelcam 8320kn

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Societe des Telecommunications Internationales du Cameroun
Intelcam
Ownership: 0.345284%
Telephone: 23 40 65 ext. 104
Telex: 9708320
Earth station and satellites:
Douala — AOR Primary - 335.5
Zamengoe — AOR Major Path 1 - 325.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Societe des Telecommunications Internationales du Cameroun
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Yaounde
Lat.°	3.8N
Long.°	11.6E
° Long. Differ. Visible	76°
Eastern Limit for GSO	88°E
Western Limit for GSO	295°E (65°W)

CANADA

Official name: Canada
Capital: Ottawa, ON
ITU country abbreviation: CAN
ITU Region: 2

International dialing code: 1

Demographic and Physical Information

Area: 10.0 million km²
Population: 28.5 million
Major languages: English, French (both official)
Time zones: GMT - 3h to GMT - 8h

Telecommunications Statistics

Number of telephones: 18.0 million
Submarine cable connections: 5
Radio stations: 900 AM, 29 FM
Television standard: NTSC
State-run television networks: 2
Private television networks: 2 plus 16 pay TV
Television stations: 53 (1400 repeaters)
Television sets: NA
TV households: NA
Cable penetration: 70%
VCR penetration: 65%
Satellite Earth stations: about 300;
4 Intelsat AOR, 1 Intelsat POR

Telecommunications Regulatory Organization

The Director General
Department of Communications
Journal Building North
300 Slater Street
Ottawa, ON K1A OC8 Canada
Telephone: +1 613-990-4225
Fax: +1 613-952-1231
Telex: 053 3342 / comtel ott
Telegraph: Comtel Ottawa

Officials

Marcel Masse, Minister of Communications
A. Gourd, Deputy Minister of Communications
G. I. Warren, Director General, International Relations
R.W. Jones, Director General, Radio Regulatory Branch

Broadcasting Services

Canadian Broadcasting Corporation — CBC
Arts & Entertainment Building
Toronto, ON M5V 3G7 Canada
Telephone: +1 416 205-3311
Telex: 621779

CTV Television Network
42 Charles Street East
Toronto, ON M4Y 1T5 Canada
Telephone: +1 416 928-6000
Fax: +1 416 928-0907
Telex: 062 2080

City TV — Much Music Network
299 Queen Street West
Toronto, ON M5V 2Z5 Canada
Telephone: +1 416 591-5757
Fax: +1 416 591-6824 (MMN) or +1 416 340-7005 (CTV)
Telex: 06 218283

Global Television Network
81 Barber Greene Road
Don Mills
Toronto, ON M3C 242 Canada
Telephone: +1 416 446-5311
Fax: +1 416 446-5371

TV Ontario — TVO (English) and La Chaine (French)
P.O. Box 200 Station Q
Toronto, ON M4T 2T1 Canada
Telephone: +1 416 484-2600
Fax: +1 416 484-4234
Telex: 06 23547

Canal Famille
2100 Rue Ste Catherine Ouest
Bureau 800
Montreal, PQ H3H 2T3 Canada
Telephone: +1 514 939-3150
Fax: +1 514 939-3151

Family Channel
BCE Place, 181 Bay Street
P.O. Box 787, Suite 100
Toronto, ON M5J 2T3 Canada
Telephone: +1 416 956-2030
Fax: +1 416 956-2035

The Sports Network (TSN)
1155 Leslie Street
Don Mills, ON M3C 2J6 Canada
Telephone: +1 416 449-2244
Fax: +1 416 391-8210
Telex: 06 966720

Other Recognized Operators

Canadian Broadcasting Corporation
P.O. Box 3220, Station C
Ottawa, ON K1Y 1E4 Canada
Telephone: +1 613 724-1200
Fax: +1 613 738-6886
Telex: 053 4260 / cbc ott

Telecomm Canada
Room 1140
10 Laurier Avenue West
Box 2410, Station D
Ottawa, ON K1P 6H5 Canada
Telephone: +1 613 560-3344
Fax: +1 613 560-3246
Telex: 053 4778 / tcts admin ott

Téléglobe Canada
680 West Sherbrooke Street
Montreal, PQ H3A 2S4 Canada
Telephone: +1 514 289-7272
Fax: +1 514 289-7083
Telex: 9100 tglobe ca
Telegraph: Teleglobe Montreal

Telesat Canada
1601 Telesat Court
Gloucester, ON K1B 5P4 Canada
Telephone: +1 613 748-0123
Fax: +1 613 748-8712
Telex: 053 4184 / Telesatott

Unitel Communications, Inc.
3300 Bloor Street West
Toronto, ON M8X 2W9 Canada
Telephone: +1 416 232-6050
Fax: +1 613 232-6840

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
International Telecommunications Satellite Organization (Intelsat)
Signatory: Téléglobe Canada
Ownership: 2.253752%
Telephone: +1 514 289-7885
Telex: 21 9215
Earth station and satellites:
Des Laurentides — AOR Major Path 1 - 325.5
Toronto — AOR Spare - 307.0
Mill Village 2 — AOR Primary - 335.5
Mill Village 3 — AOR Spare - 359.0
Mill Village 4 — AOR Major Path 2 - 342.0
Lake Cowichan 1 — POR Primary - 174.0
Lake Cowichan 2 — POR Spare - 180.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Téléglobe Canada
Ownership: 1.649% (1991)
Earth station:
Laurentides (AORE)

Domestic Satellite Network

Anik

Operator:
Telesat Canada
1601 Telesat Court
Gloucester, ON K1B 5P4 Canada
Telephone: +1 613 748-0123
Fax: +1 613 748-8712
Telex: 053 4184
Satellites:
Anik C1 252.7°E (107.3°W)
Anik C2 250°E (110°W)
Anik C3 245.1°E (114.9°W)
Anik D1 255.5°E (104.5°W)
Anik D2 249°E (111°W)
Anik E1 248.9° (111.1°W)
Anik E2 252.7°(107.3°W)

Range of Geostationary Satellites Visible

Some representative locations:

Location	Calgary, AB
Lat.°	51N
Long.°	114.2W
°Long. Differ. Visible	68°
Eastern Limit for GSO	314°E (46°W)
Western Limit for GSO	178°E (182°W)

Location	Edmonton
Lat.°	53.5N
Long.°	113.5W
°Long. Differ. Visible	67°
Eastern Limit for GSO	314°E (46°W)
Western Limit for GSO	210°E (2\150°W)

Location	Fredericton, NB
Lat.°	46.9N
Long.°	66.7W
°Long. Differ. Visible	70°
Eastern Limit for GSO	3°E
Western Limit for GSO	223°E (137°W)

Location	Halifax
Lat.°	44.6N
Long.°	63.6W
°Long. Differ. Visible	71°
Eastern Limit for GSO	7°E
Western Limit for GSO	45.6°E

Location	Montreal, PQ
Lat.°	45.6N
Long.°	76.3W
°Long. Differ. Visible	71°
Eastern Limit for GSO	358°E (2°W)
Western Limit for GSO	216°E (144°W)

Location	Ottawa, ON
Lat.°	45.5N
Long.°	75.7W
°Long. Differ. Visible	71°
Eastern Limit for GSO	255°E (5°W)
Western Limit for GSO	213°E (147°W)

Location	Quebec City, PQ
Lat.°	46.9N
Long.°	71.2W
°Long. Differ. Visible	70°
Eastern Limit for GSO	229°E (1°W)
Western Limit for GSO	219°E (141°W)

Location	Regina, SK
Lat.°	50.5N
Long.°	104.6W
°Long. Differ. Visible	69°
Eastern Limit for GSO	324°E (36°W)
Western Limit for GSO	186°E (174°W)

Location	St. John's, NF
Lat.°	47.6N
Long.°	52.7W
°Long. Differ. Visible	70°
Eastern Limit for GSO	343°E (17°W)
Western Limit for GSO	237°E (123°W)

Location	Toronto, ON
Lat.°	43.7N
Long.°	79.3W
°Long. Differ. Visible	71°
Eastern Limit for GSO	252°E (8°W)
Western Limit for GSO	210°E (150°W)

Location	Vancouver, BC
Lat.°	49.3N
Long.°	123.2W
°Long. Differ. Visible	68°
Eastern Limit for GSO	303°E (57°W)
Western Limit for GSO	167°E (193°W)

Location	Whitehorse, YK
Lat.°	60.7N
Long.°	135W
°Long. Differ. Visible	62°
Eastern Limit for GSO	287°E (73°W)
Western Limit for GSO	163°E (197°W)

Location	Winnipeg, MB
Lat.°	49.9N
Long.°	97.2W
°Long. Differ. Visible	69°
Eastern Limit for GSO	332°E (28°W)
Western Limit for GSO	194°E (166°W)

Location	Yellowknife, NT
Lat.°	62.5N
Long.°	114.3W
°Long. Differ. Visible	60°
Eastern Limit for GSO	305°E (55°W)
Western Limit for GSO	185°E (175°W)

CANARY ISLANDS (SPAIN)

Range of Geostationary Satellites Visible

Location	Tenerife
Lat.°	28.3N
Long.°	16.6W
°Long. Differ. Visible	75°
Eastern Limit for GSO	59°E
Western Limit for GSO	268°E (92°W)

CAPE VERDE

Official name: Republic of Cape Verde
Capital: Praia
ITU country abbreviation: CPV
ITU Region: 1

International telephone dialing code: 238
International telex dialing code: 938

Demographic and Physical Information

Area: 4,030 km²
Population: 435,983
Major languages: Portuguese, Crioulo
Time zones: GMT - 1h

Telecommunications Statistics

Number of telephones: <1,700
Submarine cable connections: 2
Radio stations: 1 AM, 6 FM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 4,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministerio dos Transportes Comercio e Turismo
Caixa Postal 15, Praia, Cape Verde
Telephone: +238 61 4124

Officials

Osvaldo Lopes da Silva, Ministro dos Transportes, Comércio e Turismo

Broadcasting Services

Televisao Experimental de Cabo Verde — Tevec
Achada Santo Antonio
Praia
Santiago de Cabo Verde
Telephone: 61 40 80 or 61 42 89

International Telecommunications Organization Membership

International Telecommunication Union

International Telecommunications Satellite Organization (Intelsat)
Signatory: C.T.T. Empresa Publica des Correios y Telecomunicacoes
CTT Praia
Ownership: 0.050000%
Telephone: 53 41 9114
Telex: 938 6086
Earth station and satellites:
Varzea — AOR Primary - 335.5

Range of Geostationary Satellites Visible

Location	Praia
Lat.°	17.2N
Long.°	25.3W
°Long. Differ. Visible	76°
Eastern Limit for GSO	51°E
Western Limit for GSO	259°E (101°W)

CAYMAN ISLANDS (UNITED KINGDOM)

Status: dependent territory of the United Kingdom
Captial: George Town
ITU abbreviation: CYM
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: NA

Demographic and Physical Information

Area: 260 km²
Population: 33,192
Major languages: English
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 35,000
Submarine cable connections: 1
Radio stations: 2 AM, 1 FM
Television standard: NA
Electrical standard: 120 vac, 60 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

The Postmaster
General Post Office
Grand Cayman, Cayman Islands

Other Recognized Operators

Cable and Wireless (West Indies) Ltd.
P.O. Box 293
George Town
Grand Cayman, Cayman Islands
Telephone: +1 809 949-7800
Fax: +1 809 949-5472
Telex: 4210 cwadmin cp

Range of Geostationary Satellites Visible

Location	Georgetown
Lat.°	19.7N
Long.°	80.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	355°E (5°W)
Western Limit for GSO	204°E (156°W)

CENTRAL AFRICAN REPUBLIC

Official name: Central African Republic
Capital: Bangui
ITU country abbreviation: CAF
ITU Region: 1

International telephone dialing code: 236
International telex dialing code: 980

Demographic and Physical Information

Area: 622,980 km²
Population: 3.21 million
Major languages: French (official); Sangho
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 1 AM, 1 FM
Television standard: SECAM K1

Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministere des Transports, Aviation Civile, Postes et Telecommunication
Bangui, Central African Republic
Telephone: +236 61 2946
Fax: +236 61 1938

Officials
Pierre Gonifei Ngaibonanou, Minister
Eugene Celestin Mbedo, Secretary General

Broadcasting Services

Televission Centrafricaine
Ave des Martyrs
P.O. Box 940
Bangui, Central African Republic
Telephone: 61 32 42
Telex: 5301

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Central African Republic
Socati Bangui
Ownership: 0.050000%
Telephone: (236) 61 67 93
Telex: 0971 5355
Earth station and satellites:
Mpoko — AOR Major Path 1 - 325.5

Range of Geostationary Satellites Visible

Location	Bangui
Lat.°	4.4N
Long.°	18.6E
°Long. Differ. Visible	76°
Eastern Limit for GSO	95°E
Western Limit for GSO	303°E (57°W)

CEYLON

see Sri Lanka

CHAD (TCHAD)

Official name: Republic of Chad
Capital: N'Djamena
ITU country abbreviation: TCD
ITU Region: 1

International telephone dialing code: 235
International telex dialing code: NA

Demographic and Physical Information

Area: 1,284,000 km²
Population: 5.6 million
Major languages: French and Arabic (both official); Sara, Sango
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 6 AM, 1 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministere des Postes et des Telecommunications
B.P. 154
N'Djamena; Chad
Telephone: (51) 4164

Officials
Nouradine Delwa Kassire, Minister of Posts and Telecommunications

Broadcasting Services

Tele Chad
B.P. 748
N'Djamena, Chad
Telephone: (51) 2622
Telex: 5307

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Societe des Telecommunications Internationales du Tchad
Ownership: 0.050000%
Earth stations: (AOR)

Range of Geostationary Satellites Visible

Location	N'Djamena
Lat.°	12.2N
Long.°	15E
°Long. Differ. Visible	76°
Eastern Limit for GSO	91°E
Western Limit for GSO	299°E (61°W)

CHANNEL ISLANDS

see Guernsey, Jersey

CHILE

Official name: Republic of Chile
Capital: Santiago
ITU country abbreviation: CHL
ITU Region: 2

International telephone dialing code: 56
International telex dialing code: 332, 352, 359, 392

Demographic and Physical Information

Area: 756,950 km²
Population: 14.16 million
Major languages: Spanish
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 768,000
Submarine cable connections: none
Radio stations: 159 AM, 0 FM, 11 shortwave
Television standard: NTSC M
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 2
Television stations: 131
Television sets: NA
TV households: 3.3 million
Cable penetration: NA
VCR penetration: 13%
Satellite Earth stations: 3 Intelsat AOR plus domestic

Telecommunications Regulatory Organization

Ministerio de Transportes y Telecomunicaciones
Amunátegui 139
Santiago de Chile
Chile
Telephone: +56 2 726503
Fax: +56 2 6995138

Officials
Germán Correa Diaz, Ministro de Transportes
Roberto Pliscoff Vasquez, Subsecretario de Telecomunicaciones

Broadcasting Services

Television Nacional de Chile
Bellavista 0990
Santiago, Chile
Telephone: (2) 777 4552
Fax: (2) 35 30 00
Telex: 241375

Corporacion de TV Universidad Catolica de Chile
Ines Matte Urrejola 0848
A.P. 14600
Santiago, Chile
Telephone: (2) 251 4000
Fax: (2) 630 2040
Telex: 440 182

Universidad de Chile Television
Ines Matte Urrejola 0825
Providencia, Chile
Telephone: (2) 77 62 73 or 77 60 65
Fax: (2) 37 79 23
Telex: 340 492

Universidad de Telenorte
Condell 272
Santiago, Chile
Telephone: (083) 26 38 47
Fax: (2) 223 2546
Telex: 341439

Universidad Catolica de Valparaiso
Ajua Santo Alto 2455
Vina Del Mar, Chile
Telephone: (032) 61 19 34 or 61 01 40 or 61 16 75
Fax: (032) 21 27 46

Other Recognized Operators

Telex Chile Comunicaciones
Telegráficas S.A.
Morandé 147
Santiago, Chile
Telephone: +56 2 6968807
Fax: +56 2 6981474
Telex: 240550 gegen cl

Empresa Nacional de Telecomunicaciones S.A.
(Entel-Chile)
Santa Lucia No. 360
Santiago, Chile
Telephone: +56 2 6902300 or 56 2 6902506
Fax: +56 2 6993424
Telex: 240543 entel cl or 240683 entel cl

Empresa Nacional de Telecomunicaciones S.A.
(Entel-Chile)
Oficina de Coordinación Internacional
Santa Lucia 360, 4 piso
Santiago, Chile
Telephone: +56 2 6902613
Fax: +56 2 6993424
Telex: 341394

Compañía de Teléfonos de Chile
San Martin #50
Casilla 16-D
Santiago, Chile
Telephone: +56 2 6912020
Fax: +56 2 6991032 or 56 2 6991182
Telex: 240955 ctch cl

All America Cables and Radio Inc.
Huérfanos 1546
Casilla 3767
Santiago, Chile
Telephone: +56 2 713025
Telex: 1200 ittchile cc

Texcom Ltda.
Morande 147
Santiago, Chile
Telephone: +56 2 6968807
Fax: +56 2 6981474
Telex: 645200 texcom ct

V.T.R. Telecomunicaciones S.A.
Bandera 168
Casilla 2107
Santiago, Chile
Fax: +56 2 6984127
Telex: 340260 pbvtr ck

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Nacional de Telecomunicaciones S.A. (Entel)
Entel Santiago
Ownership: 0.654975%
Telephone: (2) 690 2560
Fax: (2) 690 2638
Telex: 34 240562/240864/240543
Earth station and satellite:
Longovillo 1 — AOR Primary - 335.5
Longovillo 2 — AOR Major Path 2 - 342.0
Longovillo 3 — AOR Major Path 1 - 325.5

International Mobile Satellite Organization (Inmarsat)
Signatory: Empresa Nacional de Telecomunicaciones S.A. (Entel)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Santiago
Lat.°	33.4S
Long.°	70.7W
°Long. Differ. Visible	74°
Eastern Limit for GSO	3°E
Western Limit for GSO	215°E (145°W)

■ CHINA, PEOPLE'S REPUBLIC OF

Official name: People's Republic of China
Capital: Beijing
ITU country abbreviation: CHN
ITU Region: 3

International telephone dialing code: 86
International telex dialing code: 716

Demographic and Physical Information

Area: 9.6 million km²
Population: 1,203 million
Major languages: Chinese, Mandarin, other regional dialects
Time zones: GMT + 8h

Telecommunications Statistics

Number of telephones: 20.0 million
Submarine cable connections: none
Radio stations: 274 AM
Television standard: PAL D
Electrical standard: 220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 202 (2,050 repeaters)
Television sets: 75 million
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 4 Intelsat POR
1 Intelsat IOR
1 INMARSAT POR/IOR
>55 domestic

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
Directorate General of Telecommunications
13 West Chang An Avenue
Beijing 100804 China
Telephone: +86 1 6011250
Fax: +86 1 6011250
Telex: 085 222185 dgtelcn

Officials
Luan Zhengxi, Director-General of Telecommunications

Director, Department of External Affairs
Ministry of Posts and Telecommunications
13 West Changan Avenue
Beijing 100804 China
Telephone: +86 1 6014670
Fax: +86 1 6011370
Telex: 085 222187 ptdex cn

Official
Zhao Xintong, Director, Department of External Affairs, Ministry of Posts and Telecommunications

Broadcasting Services

China Central Television — CCTV
No. 11 Fuxing Road
Beijing 100859 China
Telephone: (1) 801 1144
Fax: (1) 801 2010
Telex: 222300

Guandong Television
686 Ren Min Bei Radd
Guangzhou, China
Telephone: (20) 66 53 76
Fax: (20) 67 70 13
Telex: 44237

Beijing Television Station
No. 14 Xin Jie Kou Wai Da Jie
Beijing, China

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Posts and Telecommunications
Pktelcom
Ownership: 1.590957%
Telephone: (1) 602 4044
Fax: (1) 602 4044
Telex: 22230
Earth station and satellites:
Beijing 1 — POR Primary - 174.0
Beijing 2 — IOR Major Path - 63.0
Beijing 3 — IOR Primary - 60.0
Shanghai — POR Primary - 174.0
Taipei 2 — POR Primary - 174.0
Taipei 3 — IOR Primary - 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Ministry of Posts and Telecommunications
Ownership: NA
Earth station:
Beijing (IOR/POR)

Domestic Satellite Network

Dongfanghong (DFH, ChinaSat)
Operator: Ministry of Posts and Telecommunications
Telephone: +86 1 601-1250
Fax: +86 1 601-1250
Telex: 222185

Satellites:

STW-1	125°E
STW-2	103°E
DFH2-A1(Chinasat)	87.5°E
DFH2-A2 (Chinasat)	110.5°E
DFH2-A3 (Chinasat)	98°E

Range of Geostationary Satellites Visible

Location	Beijing
Lat.°	39.9N
Long.°	116.3E
°Long. Differ. Visible	72°
Eastern Limit for GSO	188°E
Western Limit for GSO	44°E

Location	Chengdu
Lat.°	30.6N
Long.°	104E
°Long. Differ. Visible	74°
Eastern Limit for GSO	178°E
Western Limit for GSO	30°E

Location	Guangzhou
Lat.°	23.1N
Long.°	113.2
°Long. Differ. Visible	75°
Eastern Limit for GSO	188°E
Western Limit for GSO	38°E

Location	Kunming
Lat.°	25N
Long.°	102.7E
°Long. Differ. Visible	75°
Eastern Limit for GSO	178°E
Western Limit for GSO	28°E

Location	Shanghai
Lat.°	31.2N
Long.°	121.4E
°Long. Differ. Visible	74°
Eastern Limit for GSO	195°E
Western Limit for GSO	47°E

Location	Tianjin
Lat.°	39.1N
Long.°	117.2W
°Long. Differ. Visible	72°
Eastern Limit for GSO	189°E
Western Limit for GSO	45°E

■ CHINA, REPUBLIC OF

see Taiwan

■ CHRISTMAS ISLAND (AUSTRALIA)

Status: territory of Australia
Official name: Territory of Christmas Island
ITU country abbreviation: CHR
ITU Region: 3

International telephone dialing code: none
International telex dialing code: none

Demographic and Physical Information

Area: 135 km²
Population: 889
Major languages: English
Time zones: GMT + 6h30m

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: 1
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: none

Range of Geostationary Satellites Visible

Location	Chr. Islands
Lat.°	10.5S
Long.°	105.7E
°Long. Differ. Visible	76°
Eastern Limit for GSO	182°E
Western Limit for GSO	30°E

■ CLIPPERTON ISLAND (FRANCE)

Range of Geostationary Satellites Visible

Location	Clipperton
Lat.°	10.3N
Long.°	109.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	175°E (185°W)
Western Limit for GSO	327°E (33°W)

■ COCOS (KEELING) ISLANDS (AUSTRALIA)

Status: territory of Australia
ITU country abbreviation: ICO
ITU Region: 3

International telephone dialing code: 61 (via Australia)
International telex dialing code: 790 (via Australia)

Demographic and Physical Information

Area: 14 km²
Population: 604
Major languages: English
Time zones: GMT + 6h30m

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 1 AM
Television standard: none
Electrical standard: 240 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1

Range of Geostationary Satellites Visible

Location	West Island
Lat.°	12.2S
Long.°	96.9E
°Long. Differ. Visible	76°
Eastern Limit for GSO	173°E
Western Limit for GSO	21°E

■ COLOMBIA

Official name: Republic of Colombia
Capital: Bogotá
ITU country abbreviation: CLM
ITU Region: 2
International telephone dialing code: 57
International telex dialing code: 396

Demographic and Physical Information

Area: 1.14 million km²
Population: 36.2 million
Major languages: Spanish
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 1.89 million
Submarine cable connections: none
Radio stations: 413 AM, 0 FM, 28 shortwave
Television standard: NTSC M
Electrical standard: 110 vac, 60 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 33
Television sets: NA
TV households: 4.65 million
Cable penetration: NA
VCR penetration: 21%
Satellite Earth stations: 2 Intelsat AOR, 11 domestic

Telecommunications Regulatory Organization

Ministerio de Comunicaciones
Edificio Murillo Toro
Carreras 7 y 8
Calle 13
Bogota D.E. 1, Columbia
Telephone: +57 1 2415532
Fax: +57 1 2849090

Officials

Alberto Casas Santamaria, Ministro de Comunicaciones
Jose Hernandez Galindo, Viceministro de Comunicaciones
José Humberto Pulido Sierra, Jefe de la Sección Internacional
Jorge Hernan Duque Botero, Secretario General, Ministro de Comunicaciones

Broadcasting Services

Inravision — Ministerio de Comunicaciones
Ave Eldorado
Bogota, Columbia
Telephone: (1) 222 1331
Telex: 43311

RTI — Canal 11 (Production Company)
Calle 19, 4/56
Pisoz
Bogota, Columbia
Telephone: (1) 282 7700
Fax: (1) 284 9012
Telex: 43294

Caracol — Canal 7 (Production Company)
Ave 19, 3/16
Apartado Aereo 9291
Bogota, Columbia
Telephone: (1) 282 2084 or 281 7900
Fax: (1) 286 3160
Telex: 41480

Punch — Canal 9 (Production Company)
Calle 43, 27/47
Bogota, Columbia
Telephone: (1) 271 4700 or (1) 269 4711
Fax: (1) 269 35 39

Inter Vision (Production Company)
Carrera 13A 3822
Bogota, Columbia
Telephone: (1) 288 0599
Fax: (1) 285 3704

Radio Cadena Nacional de Television — RCN (Production Company)
Ave de las Americas, 65/82
Bogota, Columbia
Telephone: (1) 290 6088
Fax: (1) 260 0924

Producciones Jes (Production Company)
Calle 21, 42 a 10
Conmutador 2685500
Bogota, Columbia
Telephone: (1) 268 5500
Fax: (1) 269 9473
Telex: 42072

Datos y Mensajes (Production Company)
Calle 38, 15/31
Bogota, Columbia
Telephone: (1) 288 0060
Fax: (1) 285 8675
Telex: 035 44325

Other Recognized Operators

Empresa Nacional de Telecommunicaciones (Telecom)
Calle 23, N.° 13-49
Bogota D.E., Columbia
Telephone: +57 1 2420660
Telex: 1)

Departamento Administrativo de Aeronáutica Civil
Dirección General
Aeropuerto El Dorado
Bogota D.E., Columbia
Telephone: +57 1 4139 894
Telex: 44844 daac co or 44620 daac co

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Nacional de Telecomunicaciones de Colombia (Telecom Bogota)
Ownership: 1.282447%
Telephone: (1) 283 8343
Fax: 284 3861
Telex: 35 44293
Earth station and satellites:
Choconta 1 — AOR Major Path 1 - 325.5
Choconta 2 — AOR Spare - 332.5
Choconta 3 — AOR Primary - 335.5
Choconta 4 — AOR Spare - 332.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Empresa Nacional de Telecomunicaciones de Colombia (Telecom)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Bogota
Lat.°	4.6N
Long.°	74W
°Long. Differ. Visible	76°
Eastern Limit for GSO	2°E
Western Limit for GSO	210°E (150°W)

COMOROS

Official name: Federal Islamic Republic of the Comoros
Capital: Moroni
ITU country abbreviation: COM
ITU Region: 1

International telephone dialing code: NA
International telex dialing code: NA

Demographic and Physical Information

Area: 2,170 km²
Population: 549,338
Major languages: Arabic and French (both official); Comoran
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: <1,800
Submarine cable connections: none
Radio stations: 2 AM, 1 FM
Television standard: none
Electrical standard: 220 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: none

Telecommunications Regulatory Organization

L'Office des Postes et des Telecommunications
P.O. Box 5000
Moroni, Comoros
Telex: 241 public ko
Telegraph: Offipostel

Officials

Jean Claude Bauer, Director-General
Ibrahim Abdullah, Deputy Director-General
Saïd Abasse Dahalani, Director of Telecommunications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Moroni
Lat.°	12.2S
Long.°	44.2E
°Long. Differ. Visible	76°
Eastern Limit for GSO	120°E
Western Limit for GSO	328°E (32°W)

COMMONWEALTH OF INDEPENDENT STATES

see individual countries

CONGO

Official name: Republic of the Congo
Capital: Brazzaville
ITU country abbreviation: COG
ITU Region: 1

International telephone dialing code: 242
International telex dialing code: 971

Demographic and Physical Information

Area: 342,000 km²
Population: 2.51 million
Major languages: French (official); many tribal languages
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 18,100
Submarine cable connections: none
Radio stations: 4 AM, 1 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 4
Television sets: NA
TV households: 6,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

L'Office National des Postes et des Telecommunications
Avenue Patrice Lumumba
Brazzaville, Congo
Telephone: +242 83 1686
Fax: +242 83 5938

Officials

Guy Menga, Minister of Posts and Telecommunications
Pascal Wnamio, Director-General
Leonard Kinzonzi, Director of Telecommunications

Broadcasting Services

Radiodiffusion Television Congolaise
B.P. 2241
Brazzaville, Congo
Telephone: 81 51 52 or 81 24 73
Telex: 5299

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ofipostel Congo
Ownership: 0.050000%
Telephone: (242) 81 33 63
Telex: 981 5252 KG
Earth station and satellites:
Mougouni — AOR Primary - 335.5

Range of Geostationary Satellites Visible

Location	Brazzaville
Lat.°	4.1S
Long.°	15.2E
°Long. Differ. Visible	76°
Eastern Limit for GSO	91°E
Western Limit for GSO	91°E (61°W)

COOK ISLANDS

Status: self-governing free association with New Zealand; fully responsible for internal affairs; New Zealand in consultation with Cook Islands responsible for external affairs
Capital: Avarua
ITU abbreviation: CKH
ITU Region: 3

International telephone dialing code: 682
International telex dialing code: NA

Demographic and Physical Information

Area: 240 km²
Population: 19,343
Major languages: English (official); Maori
Time zones: GMT - 11h

Telecommunications Statistics

Number of telephones: 2,052
Submarine cable connections: none
Radio stations: 1 AM, 1 FM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: 1
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Director General
Chief Post Office
Raratonga, Cook Islands
Telephone: +682 29470
Fax: +682 20990
Telex: 0772 62010 /comdiv rg

Officials
Mr. Stewart Davies, Director General

Other Recognized Operators

Telecom Cook Islands Ltd.
P.O. Box 106
Rarotonga, Cook Islands
Telephone: +682 29680
Fax: +682 20990
Telex: 0772 62010 rg

Officials
P.J. Richards, Manager, Cable and Wireless Plc.

Range of Geostationary Satellites Visible

Location	Cook Islands
Lat.°	17S
Long.°	160W
°Long. Differ. Visible	76°
Eastern Limit for GSO	236°E (124°W)
Western Limit for GSO	84°E

■ CORSICA (FRANCE)

Range of Geostationary Satellites Visible

Location	Ajaccio
Lat.°	42N
Long.°	9E
°Long. Differ. Visible	72°
Eastern Limit for GSO	81°E
Western Limit for GSO	297°E (63°W)

■ COSTA RICA

Official name: Republic of Costa Rica
Capital: San José
ITU country abbreviation: CTR
ITU Region: 2

International telephone dialing code: 506
International telex dialing code: 303

Demographic and Physical Information

Area: 51,100 km²
Population: 3.4 million
Major languages: Spanish
Time zones: GMT - 6h

Telecommunications Statistics

Number of telephones: 292,000
Submarine cable connections: none
Radio stations: 71 AM, 0 FM, 13 shortwave
Television standard: NTCS M
Electrical standard: 120 vac, 60 Hz
State-run television networks: 1
Private television networks: 7
Television stations: 18
Television sets: NA
TV households: 477,000
Cable penetration: 30%
VCR penetration: 10%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministerio de Gobernacion y Policia
Direccion Nacional de Comunicaciones
Apartado 8000
1000 San Jose, Costa Rica
Telephone: +506 53 1901

Officials
Miriam Calvo Quesada, Directora General de Comunicaciones

Broadcasting Services

Teletica — Canal 7 y 11
P.O. Box 3876-1000
San Jose, Costa Rica
Telephone: +506 32 22 22
Fax: +506 31 75 45
Telex: 2220 Tvtica

Multivision de Costa Rica — Canal 4 y 9
Apartado Postal 4666
1000 San Jose, Costa Rica
Telephone: +506 33 44 44
Fax: +506 21 17 34
Telex: 3043

Telesistema Nacional SA — Canal 2
Apartado Postal 2860
1000 San Jose, Costa Rica
Telephone: +506 31 22 22
Fax: +506 32 60 87
Programs: 31 07 91
Telex: 2443

Corporacion Costarricense de Television SA
Telecentro — Canal 6
Apartado Postal 2860
1000 San Jose, Costa Rica
Telephone: +506 32 92 55
Fax: +506 32 60 87
Telex: 2443

Other Recognized Operators

Instituto Costarricense de Electricidad (ICE)
Apartado 10032
1000 San Jose, Costa Rica
Telephone: +506 20 7422
Fax: +506 20 1555
Telex: 2440 icepre cr

Instituto Costarricense de Electricidad
Apartado 10032
1000 San Jose, Costa Rica
Telephone: +506 53 2727
Fax: +506 53 0808 or +506 53 4545
Telex: 2225 telecom cr

Radiográfica Costarricense S.A. (Racsa)
Apartado 54
1000 San Jose, Costa Rica
Telephone: +506 21 4518
Fax: +506 23 1692
Telex: 1001 racsager cr

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
International Telecommunications Satellite Organization (Intelsat)
Signatory: Instituto Costarricense de Electricidad
Telecom San Jose
Ownership: 0.050000%
Telephone: 25 74 75
Fax: 53 45 45
Earth station and satellites:
Tarbaca — AOR Major Path 1 - 325.5

Range of Geostationary Satellites Visible

Location	San Jose
Lat.°	9.9N
Long.°	84W
°Long. Differ. Visible	76°
Eastern Limit for GSO	252°E (8°W)
Western Limit for GSO	200°E (160°W)

■ COTE D'IVOIRE (IVORY COAST)

Official name: République de Côte d'Ivoire
Capital: Yamoussoukro (de jure); Abidjan (de facto)
ITU country abbreviation: CTI
ITU Region: 1

International telephone dialing code: 225
International telex dialing code: 969

Demographic and Physical Information

Area: 322,460 km²
Population: 14.79 million
Major languages: French (official); Dioula
Time zones: GMT

Telecommunications Statistics

Number of telephones: 87,700
Submarine cable connections: 2
Radio stations: 17 AM, 13 shortwave
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1

Private television networks: none
Television stations: 18
Television sets: NA
TV households: 650,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministère des Postes et des Télécommunications
01 Boîte Postale 8635
Abidjan 01, Côte d'Ivoire
Telephone: +225 34 73 15
Fax: +225 34 73 17

Officials

Yao Nicolas Kouassi Akon, Minister of Posts and Telecommunications

Broadcasting Services

Radio Television Ivoirienne — RTI
B.P. 883
Abidjan 08, Cote d'Ivoire
Telephone: +225 43 90 39
Telex: 26110

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the République de Côte d'Ivoire
Intelci
Ownership: 0.2000060%
Telephone: 34 66 54
Telex: 983 23790
Earth station and satellites:
Abidjan 1 — AOR Major Path 1 - 325.5
Abidjan 2 — AOR Primary - 335.5

Range of Geostationary Satellites Visible

Location	Abidjan
Lat.°	5.4N
Long.°	4.0W
° Long. Differ. Visible	76°
Eastern Limit for GSO	72°E
Western Limit for GSO	280°E (80°W)

■ CRETE (GREECE)

Range of Geostationary Satellites Visible

Location	Iraklion
Lat.°	35.2N
Long.°	25E
° Long. Differ. Visible	73°
Eastern Limit for GSO	98°E
Western Limit for GSO	312°E (48°W)

■ CROATIA

Official name: Republic of Croatia
Capital: Zagreb
ITU country abbreviation: HRV
ITU Region: 1

International telephone dialing code: 385
International telex dialing code: 062

Demographic and Physical Information

Area: 56,538 km²
Population: 4.7 million
Major languages: Serbo-Croatian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 350,000
Submarine cable connections: NA
Radio stations: 14 AM, 8 FM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 12 (2 repeaters)
Television sets: 1.03 million
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization

Ministry of Maritime Affairs, Transport and Communications
Prisavlje 14
HR-41000 Zagreb, Croatia
Telephone: +385 41 614 004
Fax: +385 41 615 015
Telex: +0599 21275 mpvrh

Official

Ivica Mudrinic, Minister of Maritime Affairs

Telecommunications Operator

Croatian Post and Telecommunications (HPT)
Draskoviceva 26
41001 Zagreb, Croatia
Telephone: 41-422-222
Fax: 41-451-782

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 0.05%

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Maritime Affairs, Transport, and Communications
Ownership: 0.050000%

Range of Geostationary Satellites Visible

Location	Zagreb
Lat.°	45.8N
Long.°	16E
° Long. Differ. Visible	70°
Eastern Limit for GSO	84°E
Western Limit for GSO	306°E (54°W)

■ CUBA

Official name: Republic of Cuba
Capital: Havana (Habana)
ITU country abbreviation: CUB
ITU Region: 2

International telephone dialing code: 53
International telex dialing code: 307

Demographic and Physical Information

Area: 110,860 km²
Population: 10.94 million
Major languages: Spanish
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 229,000
Submarine cable connections: none
Radio stations: 150 AM, 5 FM
Television standard: NTSC M
Electrical standard: NA
State-run television networks: 1
Private television networks: none
Television stations: 58
Television sets: 1.53 million
TV households: 2.3 million
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministerio de Comunicaciones
Plaza de la Revolución "José Marti"
La Habana CP 10600 Cuba
Telephone: +53 7 74890
Fax: +53 7 70 65 15

Officials

Manuel Castillo Rabassa, Minister of Communications
Mercedes Carracedo Soto, First Deputy Minister, Communications
Alberto L. Escalona Calderon, Deputy Minister, Telecommunications

Broadcasting Services

Instituo Cubano de Radio y Television — ICRT — Canal 2 - Canal 6
Calle 23, entre L y M
Vedado, La Habana 4 10600 Cuba
Telephone: 32 50 00 or 32 55 01 or 32 75 11

Other Recognized Operators

Radio Corporation of Cuba
Apartado 1130
La Habana CP 10300 Cuba
Telephone: +53 7 68211
Telex: 511185

The Western Union Telegraph Co.
Obispo 351
La Habana CP 10200 Cuba
Telephone: +53 7 69901
Telex: 511140

Intertel, S.A.
Compañía Internacional de Telecomunicaciones S.A.
Calle 22 No. 312 e/3ra. y 5ta
Apartado postal 628
Miramar, Código Postal 11300
La Habana, Cuba
Telephone: +53 7 620436 or +53 7 626565
Telex: 512322 or 512321

Laboratorio Central de Telecomunicaciones (LACETEL)
Carr. Rancho Boyeros, Km. 14 1/2
Santiago de la Vegas
La Habana, Cuba
Telephone: +53 7 202929
Telex: 512262 or 512263

International Telecommunications Organization Membership

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)
Signatory: Emtelcuba
Telephone: 537 224144
Telex: 512560
Earth station and satellites:
Caribe — AOR Major Path 1 - 325.5

Range of Geostationary Satellites Visible

Location	Havana
Lat.°	23.2N
Long.°	82.4W
°Long. Differ. Visible	75°
Eastern Limit for GSO	353°E (7°W)
Western Limit for GSO	202°E (158°W)

CURACO (NETHERLANDS ANTILLES)

Status: autonomous part of Netherlands
ITU abbreviation: ATN
ITU Region: 2

International telephone dialing code: 599
International telex dialing code: 384

Demographic and Physical Information

Area: 960 km²
Population: 203,505
Major languages: Dutch
Time zones: GMT - 3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: 2
Radio stations: 9 AM, 4 FM
Television standard: NTSC M
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: NA
Private television networks: 1
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Landsradio-Telecommunications Administration
Netherlands Antilles
P.O. Box 103
Head Office: Schouwbergweg 22
Willemstad, Curaçao, Netherlands Antilles
Telephone: +599 9 63 11 11
Fax +599 9 63 13 21
Telex: 1975 lrdir na

Officials
Mr. R.A.C. Bernadina, Director, Landsradio Telecommunication Administration

Broadcasting Services

Tele Curacao
P.O. Box 415 - Berg Ararat
Netherlands Antilles
Telephone: +599 9 61 12 88
Fax: +599 9 61 41 38

Other Recognized Operators

Signatory: Landsradio N. Antilles
Telephone: +599 63 13 41
Fax: +599 63 13 21
Earth station and satellites:
Vrendeberg 1 — AOR Primary - 335.5
Vrendeberg 2 — AOR Major Path 1 - 325.5

Range of Geostationary Satellites Visible

Location	Willemstad
Lat.°	12.2N
Long.°	69W
°Long. Differ. Visible	76°
Eastern Limit for GSO	7°E
Western Limit for GSO	215°E (145°W)

CYPRUS

Official name: Republic of Cyprus
Note: unofficially divided into Greek and Turkish sectors
Capital: Nicosia
ITU country abbreviation: CYP
ITU Region: 1

International telephone dialing code: 357
International telex dialing code: 0605

Demographic and Physical Information

Area: 9,250 km²
Population: 736,636
Major languages: Greek, Turkish, English
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 210,000
Submarine cable connections: 3
Radio stations: 11 AM, 8 FM in Greek sector; 2 AM, 6 FM in Turkish sector
Television standard: SECAM in Greek sector; PAL in Turkish sector
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 1 (34 repeaters) in Greek sector; 1 in Turkish sector
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: 55%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Communications and Works
Nicosia, Cyprus
Telephone: 2 30 22 78
Telex: 0605 3678

Officials
Adamos Adamides, Minister of Communications and Works
Nicos Symeonides, Director-General

Telecommunications Operator

Cyprus Telecommunications Authority
Telecommunications Street
P.O. Box 4929
Nicosia 142, Cyprus
Telephone: 2 31 3111
Fax: 2 49 71 55
Telex: 0605-3288 cyta adm cy or 2288 cytaenac cy

Broadcasting Services

Cyprus Broadcasting Corporation — CBC
P.O. Box 4824
Nicosia, Cyprus
Telephone: 2 42 22 31
Fax: 2 31 40 50
Telex: 0605-2333

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment Share 2.26456%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Cyprus Telecommunications Authority Cyta Nicosia
Ownership: 0.234556%
Telephone: (2) 54 52 55
Fax: (2) 36 73 55
Telex: 605 4288
Earth station and satellites:
Makarios 1 — AOR Primary - 335.5
Makarios 2 — IOR Primary - 60.0

Range of Geostationary Satellites Visible

Location	Nicosia
Lat.°	35.2N
Long.°	33.4E
°Long. Differ. Visible	73°
Eastern Limit for GSO	110°E
Western Limit for GSO	320°E (40°W)

CZECH REPUBLIC

Official name: Czech Republic
Capital: Prague
ITU country abbreviation: CZE
ITU Region: 1

International telephone dialing code: 42
International telex dialing code: 066

Demographic and Physical Information

Area: 78,703 km²
Population: 10.44 million
Major languages: Czech, Slovak
Time zones: GMT +1h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: NA
Television standard: VHF: SECAM D; UHF: SECAM K
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: 1%
VCR penetration: 6%
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministry of Economy of the Czech Republic
Department of Telecommunications
Staromestske nam.6
11015 Praha 1, Czech Republic
Telephone: 2-712-111
Fax: 2-730-0960

Official
Vladimir Sedlácek, Head, Department of Telecommunications

International Affairs Department
Klimentská 27
12502 Praha 1, Czech Republic
Telephone: +42 2 24812852-9
Fax: +42 2 2481 2995

Official
Ms. Marcela Gürlichová, Head, International Relations

Telecommunications Operator

SPT Telecom International
Olanská 6
13084 Praha 3, Czech Republic
Telephone: 2-714-3242
Fax: 2-691-9062

Broadcasting Services

Ceskoslovensky Rozhlas (Radio)
Vinohradská 12
12099 Praha 2, Czech Republic
Telephone: 2-2115
Telex: 066 121059

Ceskoslovenská Televize (TV)
Gorkého nám. 29-30
11150 Praha 1, Czech Republic
Telephone: 2-221-247
Telex: 066 121800

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 0.05%
International Maritime Satellite Organization (Inmarsat): Investment share 0.05%

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Prague
Lat.°	50.1N
Long.°	14.4E
°Long. Differ. Visible	69°
Eastern Limit for GSO	83°E
Western Limit for GSO	305°E (55°W)

DENMARK

Official name: Kingdom of Denmark
Capital: Copenhagen
ITU country abbreviation: DNK
ITU Region: 1

International telephone dialing code: 45
International telex dialing code: 055

Demographic and Physical Information

Area: 43,070 km²
Population: 5.2 million
Major languages: Danish
Time zones: GMT +1h

Telecommunications Statistics

Number of telephones: 4.5 million
Submarine cable connections: 19
Radio stations: 3 AM, 2 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 50
Television sets: NA
TV households: 2.1 million
Cable penetration: 54%
VCR penetration: 24%
Satellite Earth stations: 7 Intelsat, Inmarsat, Eutelsat

Telecommunications Regulatory Organization

National Telcom Agency
Coordination Division
Holstansgade #63
DK-2100 Copenhagen, Denmark
Telephone: 35-43 0333
Fax: 35-431434

Official
Abild Andersen, Director

Telecommunications Operator

Tele Denmark A/S
Dagmarhus
H.C. Andersens Boulevard 12,6
DK-1553 Köbenhavn V, Denmark
Telephone: 33 337777
Fax: 33 337718

Broadcasting Services

Danish Broadcasting Corporation — DR
TV Center
Moekhoejvej 170 - DK-2860
Soeborg, Denmark
Telephone: 35-203040
Fax: 35-202109
Telex: 055-22695

Kanal 2
Mileparken #20 A
DK-2740 Skovlunde, Denmark
Telephone: 42- 91 66 99
Fax: 42- 84 13 60 (reception)
or 42 91 22 70 (administration)
Telex: 055-21136

TV 2
Rugaardsvej 25
DK-5100 Odense, Denmark
Telephone: 65- 91 12 44
Fax: 65-91 33 22
Telex: 055-59660

Sortedam Dossering 55A
DK-2100 Copenhagen, Denmark
Telephone: 35-37 22 00
Fax: 35-37 22 00
Telex: 055-21122

Other Recognized Operators

GN Great Northern Telegraph Company Ltd.
(GN Store Nordiske Telegraf-Selskab)
Kongens Nytorv 26
P.O. Box 2167
DK-1016 København K, Denmark
Telephone: 33 120088
Fax: 33 120389
Telex: 055-22371 gntc dk

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 2.04601%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Tele Danmark A/S
Telecom Denmark
Ownership: 0.549120%
Telephone: 38-34 55 22
Fax: 31-10 33 35
Telex: 055-9126818
Earth stations: NA

International Maritime Satellite Organization (Inmarsat)
Signatory: Tele Danmark A/S
Ownership: 2.325%
Earth station: NA

Range of Geostationary Satellites Visible

Location	Copenhagen
Lat.°	55.7N
Long.°	12.6E
°Long. Differ. Visible	66°
Eastern Limit for GSO	78°E
Western Limit for GSO	307°E (53°W)

DJIBOUTI

Official name: Republic of Djibouti
Capital: Djibouti
ITU country abbreviation: DJI
ITU Region: 1

International telephone dialing code: 253
International telex dialing code: 0979

Demographic and Physical Information

Area: 22,000 km²
Population: 421,320
Major languages: French and Arabic (both official), Somali, Afar
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: 1
Radio stations: 2 AM, 2 FM
Television standard: SECAM B, SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR, 1 Arabsat

Telecommunications Regulatory Organization

Office des Postes et des Telecommunications (OPT)
Boulevard de la République
Djibouti
Telephone: 350669
Fax: 355757

Officials

Ahmed Waberi Guedi, Minister of Transports, Tourism, Posts and Telecommunications
Elmi Obsieh Waiss, Director-General, OPT

Broadcasting Services

Radio Television de Djibouti
P.O. Box 97
Djibouti
Telephone: 35 22 94
Telex: 0979

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): Investment Share 0.12%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Stid Djibouti
Ownership: none
Telephone: 34 15 04
Fax: 35 01 09
Telex: 0979 5900
Earth stations:
Ambouli — IOR Primary - 60.0

Range of Geostationary Satellites Visible

Location	Djibouti
Lat.°	11.5N
Long.°	43.1W
°Long. Differ. Visible	76°
Eastern Limit for GSO	119°E
Western Limit for GSO	327°E (33°W)

DOMINICA

Official name: Commonwealth of Dominica
Capital: Roseau
ITU country abbreviation: DMA
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: 304

Demographic and Physical Information

Area: 750 km²
Population: 82,608
Major languages: English (official); French patois
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 4,600
Submarine cable connections: none
Radio stations: 3 AM, 2 FM
Television standard: SECAM K
Electrical standard: 230 vac, 50 Hz
State-run television networks: 0
Private television networks: 1
Television stations: 1 (cable)
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

The Permanent Secretary
Ministry of Communications and Works
Roseau, Dominica
The Postmaster General
General Post Office
Roseau, Dominica
Telephone: +1 809-448-2401

Broadcasting Services

Marpin TV Channel 5
Turkey Lane
Roseau, Dominica
Telephone: +1 809-448-4107
Fax: +1 809-448-2965

Other Recognized Operators

Cable and Wireless (West Indies) Ltd.
Mercury House
P. O. Box 6
Roseau, Dominica
Telephone: +1 809-448-1000
Telex: 8610 domgr do
Fax: +1 809-448-1111

International Telecommunications Organization Membership

none

Range of Geostationary Satellites Visible

Location	Roseau
Lat.°	15.3N
Long.°	61.4W
°Long. Differ. Visible	76°
Eastern Limit for GSO	15°E
Western Limit for GSO	223°E (137°W)

# DOMINICAN REPUBLIC

Official name: Dominican Republic
Capital: Santo Domingo
ITU country abbreviation: DOM
ITU Region: 2

International telephone dialing code: 1809
International telex dialing code: 346, 366

Demographic and Physical Information

Area: 48,730 km²
Population: 7.52 million
Major languages: Spanish
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 190,000
Submarine cable connections: 1
Radio stations: 120 AM, 0 FM, 6 shortwave
Television standard: NTSC M
Electrical standard: 110 vac, 60 Hz
State-run television networks: 1
Private television networks: 5
Television stations: 18
Television sets: NA
TV households: NA
Cable penetration: 43%
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Dirección General de Telecomuniciones
Santo Domingo, Dominican Republic
Telephone: +1 809-682-2244
Telex: 3466004

Officials

Sr. Leopoldo Nuñez Santos, Director General

Broadcasting Services

Radio Television Dominicana — Canal 4, 5, 12
Avenida San Martin
P. O. Box 969
Santo Domingo, Dominican Republic
Telephone: +1 809-689-2121 / 689-2127 / 682-8845
Telex: 5448
Fax: +1 809-682-9927

Color Vision - Corporación Dominica de Radio y TV - Canal 9
Calle Emilio A. Morel
Santo Domingo, Dominican Republic
Telephone: +1 809-566-5875 / 566-5876
Telex: 326 4327

Rahintel Television - Canal 7
Avenida Independencia
Centro de los Heros, Apt. 1220
Santo Domingo, Dominican Republic
Telephone: +1 809-533-33151 / 533-2155

Telesistema Dominicano
Calle El Vergel 88
Santo Domingo, Dominican Republic
Telephone: +1 809-567-1251

Tele Antillas
Apt. 416
Santo Domingo, Dominican Republic
Telephone: +1 809-567-7751

Other Recognized Operators

Compañía Dominicana de Teléfonos, C. por A.
Apartado 1377
Santo Domingo, Dominican Republic
Telephone: +1 809-543-2000
Telex: 346 6004 / 346 6005

All America Cables and Radio Inc.
Julio Verne 21
Apartado 91
Santo Domingo, Dominican Republic
Telephone: +1 809-682-3115
Telex: 346 0001

Compañía Dominicana de Telex, C. por A.
Apartado 1027
Santo Domingo, Dominican Republic

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Compania Dominicana de Telefonos
Ownership: 0.283647%
Earth stations:
Cambita (AOR major path) — 325.5

Range of Geostationary Satellites Visible

Location	Santo Domingo
Lat.°	18.5N
Long.°	70W
°Long. Differ. Visible	76°
Eastern Limit for GSO	6°E
Western Limit for GSO	214°E (146°W)

EASTER ISLAND (CHILE)

Range of Geostationary Satellites Visible

Location	Easter Island
Lat.°	27S
Long.°	109W
°Long. Differ. Visible	75°
Eastern Limit for GSO	326°E (34°W)
Western Limit for GSO	176°E (184°W)

ECUADOR

Official name: Republic of Ecuador
Capital: Quito
ITU country abbreviation: EQA
ITU Region: 2

International telephone dialing code: 593
International telex dialing code: 393

Demographic and Physical Information

Area: 283,560 km²
Population: 10.9 million
Major languages: Spanish, Quechua
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 318,000
Submarine cable connections: none
Radio stations: 272 AM, 0 FM, 39 shortwave
Television standard: NTSC M
Electrical standard: 110, 120, and 127 vac, 60 Hz

State-run television networks: none
Private television networks: 3
Television stations: 33
Television sets: NA
TV households: 620,000
Cable penetration: NA
VCR penetration: 17%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Instituto Ecuatoriano de Telecomunicaciones (Ietel)
Cassila postal No. 3066
Quito, Ecuador
Telephone: +593 256-0700
Telex: 22202 ietgg ed
Fax: +593 256-8000

Dirección de la Marina Mercante y del Litoral
Malencon Simon Bolivar y Clemente Ballen
Guayaquil, Ecuador
Telephone: +593 432-162
Telex: 43325 dmecg ed
Fax: +593 432-4246

Officials

Excmo. Ing. Carrasco, Ministero de Obras Públicas y Comunicaciones
Ing. Jorge Lanas Silva, Subsecretaria de Obras Públicas y Telecomunicaciones
Ing. Sergio Flores Macias, Gerente General del Ietel

Broadcasting Services

Teleamazonas — Canal 4
Avenida America y Diguja
P. O. Box 4844
Quito, Ecuador
Telephone: +593 243-0313 / 243-0353
Telex: 22244
Fax: +593 244-2151

Cadena Ecuatoriana de Television — Canal 10
P. O. Box 09-01-673
Guayaquil, Ecuador
Telephone: +593 439-3248
Telex: 3530 diez tv ed
Fax: +593 428-7544

Telecuatro Guayaquil — Canal 4
Avenida 9 de Octobre 1200
P. O. Box 11269
Guayaquil, Ecuador
Telephone: +593 430-0006 / 430-8194 / 430-0340 / 443-0313
Telex: 3198
Fax: +593 431-3436

Corporación Ecuatoriana de Television S.A.
Equavisa — Canal 2
Cerro del Carmen s/n
Guayaquil, Ecuador
Telephone: +593 430-9444 / 430-0150 /430-5571
Telex: 038 43409
Fax: +593 430-3677 / 431-4816

Television del Pacifico — Canal 2
Murgeon 732 y Avenida America
P. O. Box 130B
Quito, Ecuador
Telephone: +593 430-8194 / 430-0006
Telex: 0308 22435

Televisora Nacional — Canal 8
Bosmediano 441 y Jose Carbo
Bellavista Apartado 6615
Quito, Ecuador
Telephone: +593 244-8100 / 244-5491
Telex: 0308 2888
Fax: +593 244-5488

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Instituto Ecuatoriano de Telecomunicaciones (Entel)
Ownership: 0.393215%
Earth stations:
Quito (AOR primary) — 335.5

Range of Geostationary Satellites Visible

Location	Quito
Lat.°	0.2S
Long.°	78.6W
°Long. Differ. Visible	77°
Eastern Limit for GSO	358°E (2°W)
Western Limit for GSO	204°E (156°W)

■ EGYPT

Official name: Arab Republic of Egypt
Capital: Cairo
ITU country abbreviation: EGY
ITU Region: 1

International telephone dialing code: 20
International telex dialing code: 091

Demographic and Physical Information

Area: 1.00 million km²
Population: 62.4 million
Major languages: Arabic (official), English, French
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 600,000
Submarine cable connections: 5
Radio stations: 39 AM, 6 FM
Television standard: VHF: SECAM B; UHF: SECAM G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 41
Television sets: NA
TV households: 4.1 million
Cable penetration: none
VCR penetration: 40%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR, 1 Inmarsat

Telecommunications Regulatory Organization

National Telecommunications Organization (Arento)
P. O. Box 2271
Cairo 11511, Egypt
Telephone: 277-7566
Telex: 091-22100

Officials

Soliman Metwally Soliman, Minister of Communications and Transport
Mahmoud M. El Soury, Chairman of the Board, Arento

Broadcasting Services

Broadcasting and Television Organization
Television Building
Cornish El-Nil St.
P. O. Box 552
Cairo, Egypt
Telephone: 757-034
Telex: 091-92152
Fax: 2 574-6189

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): Investment Share 1.59%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Republic of Egypt
Ownership: 0.649338%
Earth stations:
Maadi 1 (AOR primary) — 335.5
Maadi 2 (IOR primary) — 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Government of the Republic of Egypt
Ownership: 0.247%
Earth station:
Maadi (AORE)

Arab Satellite Communications Organization (Arabsat)

Range of Geostationary Satellites Visible

Location	Cairo
Lat.°	30N
Long.°	81.2E
°Long. Differ. Visible	74°
Eastern Limit for GSO	106°E
Western Limit for GSO	317°E (43°W)

ELBA (ITALY)

Range of Geostationary Satellites Visible

Location	Elba
Lat.°	42.8N
Long.°	10.2W
°Long. Differ. Visible	71°
Eastern Limit for GSO	82°E
Western Limit for GSO	299°E (61°W)

EL SALVADOR

Official name: Republic of El Salvador
Capital: San Salvador
ITU country abbreviation: SLV
ITU Region: 2

International telephone dialing code: 503
International telex dialing code: 301

Demographic and Physical Information

Area: 21,040 km²
Population: 5.87 million
Major languages: Spanish
Time zones: GMT - 6h

Telecommunications Statistics

Number of telephones: 116,000
Submarine cable connections: none
Radio stations: 77 AM, 0 FM, 2 shortwave
Television standard: NTSC M
Electrical standard: 115 vac, 60 Hz
State-run television networks: 2
Private television networks: 4
Television stations: 5
Television sets: NA
TV households: 425,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Administración Nacional de Telecomunicaciones (Antel)
Centro del Gobierno
San Salvador, El Salvador
Telephone: +503 71 70 67
Telex: 20252
Fax: +503 21 54 16

Officials

Joaquin Cerna Flores, Director General
Saúl Suster Ramirez, President, Antel

Broadcasting Services

Canal 4
Ave. Olimpica y Carretera Panamericana
Apartado Postal 444
San Salvador, El Salvador
Telephone: +503 24 45 55
Telex: 20443
Fax: +503 24 57 08

Canal 2
Alameda Dr. M.E. Araujo
Apartado Postal 720
San Salvador, El Salvador
Telephone: +503 24 10 15
Telex: 0373
Fax: +503 24 57 08

Canal 6
KM6 Carretera a Santa Tecla
Apartado Postal 720
San Salvador, El Salvador
Telephone: +503 23 51 22
Telex: 20443
Fax: +503 24 37 02

Canal 12
Colonia San Benito
Ave. Las Magnolias 142
San Salvador, El Salvador
Telephone: +503 24 61 71 / 24 01 18 / 24 59 56
Telex: 20051

Canal 8/10 — Dirección General de Communicacion y Tecnologia Educativa
Apartado Postal 104
Nuevas
San Salvador, El Salvador
Telephone: +503 28 04 99
Telex: 21046tvn
Fax: +503 28 09 73

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Administracion Nacional de Telecomunicaciones (Antel)
Ownership: 0.050000%
Earth stations:
Izalco (AOR major path) — 325.5

Range of Geostationary Satellites Visible

Location	San Salvador
Lat.°	13.7N
Long.°	89.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	347°E (13°W)
Western Limit for GSO	195°E (165°W)

EQUATORIAL GUINEA

Official name: Republic of Equatorial Guinea
Capital: Malabo
ITU country abbreviation: GNE
ITU Region: 1

International telephone dialing code: 240
International telex dialing code: 0999

Demographic and Physical Information

Area: 28,050 km²
Population: 420,293
Major languages: Spanish
Time zones: GMT +1h

Telecommunications Statistics

Number of telephones: 2,000
Submarine cable connections: none
Radio stations: 2 AM
Television standard: NA
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Direccion General de Correos y de Telecomunicaciones
Malabo, Equatorial Guinea
Telephone: +240 2214

Officials

Don Marcelino Oyono Ntutumu, Director-General

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Malabo
Lat.°	3.7N
Long.°	8.8W
°Long. Differ. Visible	76°
Eastern Limit for GSO	85°E
Western Limit for GSO	293°E (67°W)

■ ERITREA

Official name: State of Eritrea
Capital: Asmara
ITU country abbreviation: ERI
ITU Region: 1

International telephone dialing code: 291
International Telex dialing code: NA

Demographic and Physical Information

Area: 121,320 km²
Population: 3.58 million
Major languages: Tigre, Kunama
Time zone: UT + 3h

Telecommunication Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: NA
Television standard: NA
Electrical standard: 220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Eritrean Post and Telecommunications Authority
P.O. Box 234
Asmara, Eritrea
Telephone: +2911 112 868
Fax: +2911 110 938

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Asmara
Lat.°	15.3N
Long.°	38.9E
°Long. Differ. Visible	76°
Eastern Limit for GSO	115°E
Western Limit for GSO	323°E (37°W)

■ ESTONIA

Official name: Republic of Estonia
Capital: Tallinn
ITU country abbreviation: EST
ITU Region: 1

International telephone dialing code: 372
International telex dialing code: NA

Demographic and Physical Information

Area: 45,100 km²
Population: 1.63 million
Major languages: Estonian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: about 400,000
Submarine cable connections: 1
Radio stations: NA
Television standard: SECAM
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 3
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Inspection of Telecommunications
Ädulu 4d
EE-0006 Tallinn, Estonia
Telephone: 2-771-496/498
Fax: 2-771-509

Official
Jüri Joema, Director

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Tallinn
Lat.°	59.4N
Long.°	24.8E
°Long. Differ. Visible	63°
Eastern Limit for GSO	88°E
Western Limit for GSO	322°E (38°W)

■ ETHIOPIA

Official name: Ethiopia
Capital: Addis Ababa
ITU country abbreviation: ETH
ITU Region: 1

International telephone dialing code: 251
International telex dialing code: 976

Demographic and Physical Information

Area: 1.13 million km²
Population: 55.98 million
Major languages: Amharic (official)
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 4 AM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: 100,000
TV households: 100,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 2 Intelsat POR

Telecommunications Regulatory Organization

Ethiopia Telecommunications Authority (ETA)
P.O. Box 1047
Addis Ababa, Ethiopia
Telephone: +251 151-0500
Telex: 21000 gentel et
Fax: +251 151-5277

Officials
Assegid Wolte Emanuel, Minister of transport and Communications
Fikru Asfaw, General Manager, ETA
Seyoum G. Christos, Manager, Operations Division
Mulugeta Asfaw, Manager, Engineering Department
Bekele Merid, Manager, Regulatory, Licensing and Standards

Broadcasting Services

Ethiopian Television
P. O. Box 5544
Patriots Street
Addis Ababa, Ethiopia
Telephone: +251 111-6705
Telex: 21429

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telecommunications Service
Ownership: 0.129015%
Earth stations:
Sululta 1 (AOR primary) — 335.5
Sululta 2 (IOR primary) — 60.0

Range of Geostationary Satellites Visible

Location	Addis Ababa
Lat.°	9.0N
Long.°	38.7E
°Long. Differ. Visible	76°
Eastern Limit for GSO	115°E
Western Limit for GSO	323°E (37°W)

FALKLAND ISLANDS (UNITED KINGDOM) (ISLAS MALVINAS)

Status: dependent territory of the United Kingdom
Capital: Stanley
ITU abbreviation: FLK
ITU Region: 1

International telephone dialing code: 500
International telex dialing code: NA

Demographic and Physical Information

Area: 12,170 km²
Population: 2,317
Time zones: English

Telecommunications Statistics

Number of telephones: 590
Submarine cable connections: none
Radio stations: 2 AM, 3 FM
Television standard: none
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 0
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

The Postmaster
General Post Office
Port Stanley, Falkland Islands
Telephone: +500 27135

Recognized private operating agency:
Cable and Wireless PLC
P. O. Box 179
Port Stanley, Falkland Islands
Telephone: +500 200801
Telex: 2411 cwadmin fk
Fax: +500 22207

Range of Geostationary Satellites Visible

Location	Port Stanley
Lat.°	51.7S
Long.°	59.8W
°Long. Differ. Visible	68°
Eastern Limit for GSO	8°E
Western Limit for GSO	232°E (128°W)

FAROE ISLANDS (DENMARK)

Status: part of the Danish realm
Capital: Torshawn
ITU country abbreviation: FRO

International telephone dialing code: 298
International telex dialing code: NA

Demographic and Physical Information

Area: 1,400 km²
Population: 48,871

Telecommunications Statistics

Number of telephones: 27,900
Submarine cable connections: 3
Radio stations: 1 AM, 3 FM (10 repeaters)
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 3 (29 repeaters)
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Range of Geostationary Satellites Visible

Location	Torshavn
Lat.°	62.0N
Long.°	7.0W
°Long. Differ. Visible	60°
Eastern Limit for GSO	67°E
Western Limit for GSO	307°E (53°W)

FIJI

Official name: Republic of Fiji
Capital: Suva
ITU country abbreviation: FJI
ITU Region: 3

International telephone dialing code: 679
International telex dialing code: NA

Demographic and Physical Information

Area: 18,270 km²
Population: 772,891
Major languages: English (official); Fijian, Hindustani
Time zones: GMT + 12h

Telecommunications Statistics

Number of telephones: 53,228
Submarine cable connections: 1
Radio stations: 7 AM, 1 FM
Television standard: none
Electrical standard: 240 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration:
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Fiji Posts and Telecommunications
P. O. Box 40
Government Buildings
Suva, Fiji
Telephone: +679 21019
Fax: +679 21 30 17 65

Officials

Vincent Lobendahn, Minister for State Television and Telecommunications
E. Nagova, Managing Director, Fiji Posts and Telecommunications Ltd.
Taufa Vakatale, Permanent Secretary

Broadcasting Services

Fiji Broadcasting Commission
Broadcasting House
P. O. Box 334
69 Gladstone Road
Suva, Fiji
Telephone: +679 31 43 33
Telex: 071 2142 fbc sv fj

Officials

Hugh Leonard, General Manager, Fiji Broadcasting Commission

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Fiji International Telecommunications Ltd.
Ownership: 0.050000%
Earth stations:
Intelsat (POR)

Range of Geostationary Satellites Visible

Location	Suva
Lat.°	18.1S
Long.°	178.5E
°Long. Differ. Visible	76°
Eastern Limit for GSO	254°E
Western Limit for GSO	103°E

■ FINLAND

Official name: Republic of Finland
Capital: Helsinki
ITU country abbreviation: FIN
ITU Region: 1

International telephone dialing code: 358
International telex dialing code: 057

Demographic and Physical Information

Area: 337,030 km²
Population: 5.08 million
Major languages: Finnish, Swedish
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 3.14 million
Submarine cable connections: 1
Radio stations: 6 AM, 105 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 235
Television sets: NA
TV households: NA
Cable penetration: 30%
VCR penetration: 45%
Satellite Earth stations: 1 Intelsat AOR (receive only; transmits via Swedish Intelsat earth station)

Telecommunications Regulatory Organization

Telecommunications Administration Centre
P. O. Box 53
FIN-00211 Helsinki, Finland
Telephone: 0 69661
Fax: 0 696-6410
Telex: 057-124545

Official
Reijo Svensson, Chief Executive Officer

Telecommunications Operator

Telecom Finland
P.O. Box 106
FIN-00511
Helsinki, Finland
Telephone: 0-70981
Telex: 057-121373
Fax: 0-709-835-26

Official
Aulis Salin, President and CEO

Broadcasting Services

TV1
Radiokatu 5
00240 Helsinki, Finland
Telephone: 0 14801
Telex: 124735
Fax: 0 1480 3390

TV2
P. O. Box 196
FIN-33270 Tampere, Finland
Telephone: 31 45 61 11
Telex: 22749
Fax: 31 45 68 92

Other Recognized Operators

Eurocable Ltd.
P. O. Box 21
00100 Helsinki, Finland
Telephone: 0 122-4221
Telex: 121165
Fax: 0 693-1326

Oy Kolmostelevisio AB Channel 3
Limalantori 2
FIN-00240 Helsinki, Finland
Telephone: 0 150-0833
Fax: 0 150-0715

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 0.33564%
International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: General Directorate of Posts and Telecommunications (INTELCOM)
Ownership: 2.182260%
Earth stations:
Intelsat AOR (receive only)

International Maritime Satellite Organization (Inmarsat)
Signatory: General Directorate of Posts and Telecommunications (INTELCOM)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Helsinki
Lat.°	60.2N
Long.°	25.0E
°Long. Differ. Visible	62°
Eastern Limit for GSO	87°E
Western Limit for GSO	323°E (37°W)

■ FRANCE

Official name: French Republic
Capital: Paris
ITU country abbreviation: F
ITU Region: 1

International telephone dialing code: 33
International telex dialing code: 842

Demographic and Physical Information

Area: 547,030 km²
Population: 58.11 million
Major languages: French
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 39.2 million
Submarine cable connections: 24
Radio stations: 41 AM, 800 FM
Television standard: SECAM L
Electrical standard: 220 vac, 50 Hz
State-run television networks: 3
Private television networks: 3
Television stations: 846 (mostly repeaters)
Television sets: 36 million
TV households: NA
Cable penetration: 2%
VCR penetration: 26%
Satellite Earth stations: 3 Intelsat AOR, 2 Intelsat IOR, Inmarsat, Eutelsat

Telecommunications Regulatory Organization

Ministère des postes et télécommunications
Ditection de la Réglementation générale
Sous-Direction Radiocommunications
20 Avenue de Ségur
F-75700 Paris, France
Telephone: 1 44 44 68 20
Telex: 250310 gentel x paris
Fax: 1 45 67 65 00

Officials
Emile Zuccarelli, Minister of Posts and Telecommunications
Bruno Lasserre, Director
de la Réglementation Générale

Telecommunications Operator

France Telecom (DI)
7, bd. Romain Rolland
F-92128 Montrouge, France
Telephone: 1-4444-4770
Telex: 042 632831 gente a f
Fax: 1-4658-5379

Official
Michel Hirsch, Directeur de l'International

Broadcasting Services (programmers)

Antenne
22 Avenue Montaigne
F-75387 Paris Cedex 08, France
Telephone: 1 44 21 42 42
Telex: 642 313
Fax: 1 44 21 51 45

Canal Plus
85-89 Quai Andre Citroen
F-75015 Paris, France
Telephone: 1 44 25 10 00
Telex: 21141
Fax: 1 44 25 12 34

M6
16 Cours Albert 1er
F-75008 Paris, France
Telephone: 1 42 56 66 66
Telex: 649781
Fax: 1 45 63 78 52

Arte
50 Avenue Théophile Gautier
F-75015 Paris, France
Telephone: 1 44 14 77 77
Telex: 891 009
Fax: 1 44 14 77 00

TV5 Europe
15 rue Cognac Jay
F-75007 Paris, France
Telephone: 1 49 55 00 05
Fax: 1 49 55 01 56

Canal J
91 bis, rue de cherche Midi
F-75006 Paris, France
Telephone: 1 49 54 54 54
Fax: 1 42 22 87 17

Canal Jimmy
45 Place Abel Gance
F-92654 Boulogne-Billancourt, France
Telephone: 1-4761-9898
Fax: 1-4761-9400

Canal France International
78 Avenue Raymond Poincaré
F-75016 Paris, France
Telephone: 1-4067-1177
Telex: 042 648647
Fax: 1-4067-1178

Eurosport
17 rue de l'Arrivée
F-75015 Paris, France
Telephone: 1-4275-1234
Fax: 1-4275-2890

MCM Euromusique
Immeuble le devant
305 av. de Jour se léve
F-92100 Boulogne-Billancourt, France
Telephone: 1-4694-6161
Fax: 1-4694-0015

Radio France Oulre-Mer
5 av. du Raymond Poincaré
F-75016 Paris, France
Telephone: 1-4524-7100
Telex: 042 648050
Fax: 1-4224-9596

Canal Infas
43 rue de Richelieu
F-75001 Paris, France
Telephone: -1-4261-5110
Fax: 1-4224-9596

Ciné-Cinemas
45 Place Abel Gance
F-92654 Boulogne-Billancourt, France
Telephone: 1-4761-99
Fax: 1-4761-9400

(transmission services)
Télédiffusion de France (TDF)
BP 518
F-92542 Montrouge Cedex, France
Telephone: 1-4965-1000
Telex: 042 250738 dir tdf f
Fax: 1-4965-1873

Other Recognized Operators

Compagnie Française de Cables Télégraphiques
7 rue de Quatre-Septembre
F-75002 Paris, France
Telephone: 1 42 96 14 77
Telex: 042 cfct 240822 f

Compagnie Radio-Maritime (CRM)
chemin de Littoral - Bât. 1
Moutepiane Port-Activités
F-13322 Marseille Cedex 16, France
Telephone: 91 03 09 30
Telex: crmdir 402139 f
Fax: 91 69 71 36

France Cables et Radio (FCR)
124, rue Réaumur
F-75091 Paris Cedex 02, France
Telephone: 1 42 21 71 71
Telex: 042 fcr x 220731 f

Société Radio-Océan
9, rue Pierre Rigaud
F-94204 Ivry sur Seine, France
Telephone: 1 45 21 52 52
Telex: 042 263024 radio/sf
Fax: 1 45 21 51 16

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat)
Signatory: France Télécom
Ownership: 19.47319%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: France Télécom
Ownership: 4.248515%
Earth stations:
Aubervilliers 2 (AOR spare) 359
Bercenay-en-Othe 1 (AOR primary) 335.5
Bercenay-en-Othe 2 (IOR major path) 63
Bercenay-en-Othe 3 (AOR primary) 335.5
Bercenay-en-Othe 9 (AOR spare) 332.5
Pleumeur Boudou 4 (AOR major path) 325.5
Pleumeur Boudou 6 (AOR major path) 342
Pleumeur Boudou 7 (AOR primary) 60
Rambouillet (AOR spare) 332.5

International Maritime Satellite Organization (Inmarsat)
Signatory: France Télécom
Ownership: 4.834%
Earth station:
Pleumeur Boudou (Inmarsat AORE)
Pleumeur Boudou (Inmarsat AORW)

Domestic Satellite Network

Operator: France Télécom
Telephone: 1 44 44 22 22
Fax: 1 46 54 53 79
Telex: gente a 200773 f

Satellites:
Telecom 1 F3 (Telecom 1C) 355°E (5°W)
Telecom 2 F1 (Telecom 2A) 352°E (8°W)
Telecom 2 F2 (Telecom 2B) 355°E (5°W)
Telecom 2 F3 (Telecom 2C) 3°E

Range of Geostationary Satellites Visible

Location	Paris
Lat.°	48.8N
Long.°	2.3E
°Long. Differ. Visible	69°
Eastern Limit for GSO	72°E
Western Limit for GSO	293°E (67°W)

■ FRENCH GUIANA (FRANCE)

Status: overseas territory of France
Capital: Cayenne
ITU country abbreviation: GUF
ITU Region: 2

International telephone dialing code: 594
International telex dialing code: NA

Demographic and Physical Information

Area: 91,000 km²
Population: 145,270
Major languages: French
Time zones: GMT - 3h

Telecommunications Statistics

Number of telephones: 18,100
Submarine cable connections: none
Radio stations: 5 AM, 7 FM
Television standard: SECAM
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 9
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Broadcasting Services

RFO-Guiane
43bis rue du Dr. Gabriel Deveze
97300 Cayenne, French Guiana
Telephone: +594 30 15 00
Telex: 910526
Fax: +594 30 26 49

Earth station:
Trou Biran 1 (AOR major path 1) 325.5

Range of Geostationary Satellites Visible

Location	Cayenne
Lat.°	5.1N
Long.°	52.3W
°Long. Differ. Visible	76°
Eastern Limit for GSO	24°E
Western Limit for GSO	231°E (129°W)

FRENCH POLYNESIA (FRANCE)

Status: overseas territory of France since 1946
Capital: Papeete, Tahiti
ITU abbreviation: OCE
ITU Region: 3

International telephone dialing code: 689
International telex dialing code: NA

Demographic and Physical Information

Area: 3,941 km²
Population: 220,000
Major languages: Tahitian, French (both official)
Time zones: GMT - 10h

Telecommunications Statistics

Number of telephones: 33,200
Submarine cable connections: none
Radio stations: 5 AM, 2 FM
Television standard: SECAM
Electrical standard: 127 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 6
Television sets: 26,400
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Direction de l'Office des Postes et Télécommunications
Papeete, French Polynesia
Telephone: +689 41 42 42
Telex: postelec 530 fp
Fax: +689 43 67 67

France Cables et Radio (FCR)
Télécommunications Extérieres de la Polynése Française
B.P. No. 99
Papeete, French Polynesia
Telephone: +689 41 54 00
Telex: (0702) 508
Fax: +689 43 75 53

Broadcasting Services

Société Nationale de Radio Television Française d'Outre Mer
B. P. 125
Papeete, French Polynesia
Telephone: +689 20551
Telex: 070200

Earth station:
Papenoo 2 (POR primary) 174

Range of Geostationary Satellites Visible

Location	Papeete
Lat.°	17.6S
Long.°	149.4E
°Long. Differ. Visible	76°
Eastern Limit for GSO	225°E
Western Limit for GSO	73°E

GABON

Official name: Gabonese Republic
Capital: Libreville
ITU country abbreviation: GAB
ITU Region: 1

International telephone dialing code: 241
International telex dialing code: 981

Demographic and Physical Information

Area: 267,670 km²
Population: 1.16 million
Major languages: French (official); Fang, Myene
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 15,000
Submarine cable connections: none
Radio stations: 6 AM, 6 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 3 (5 repeaters)
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 3 Intelsat AOR, 12 domestic

Telecommunications Regulatory Organization

Ministère de la communication, des postes, et télécommunications
Port-parole du Gouvernement
BP 2280
Libreville, Gabon
Telephone: +241 76 01 09
Telex: 5361 go

Officials
S.E.M. Jean-Remy Pendy-Bouyiki, Minister

Broadcasting Services

Radiodiffusion Television Gabonaise Channel 1
B. P. 150
Libreville, Gabon
Telephone: +241 73 27 84
Telex: 5558

Radiodiffusion Television Gabonaise Channel 2
B. P. 2229
Libreville, Gabon
Telephone: +241 73 02 00 / 76 32 96
Telex: 5508

Other Recognized Operators

Télécommunications Internationales Gabonaises (TIG)
B.P. 2261
Libreville, Gabon
Telephone: +241 72 27 56
Telex: tig5200go
Fax: +241 74 19 09

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Société des Télécommunications Internationales Gabonaises (TIG)
Ownership: 0.050000%
Earth stations:
Nkoltang 1 (AOR primary) 335.5
Nkoltang 2 (AOR major path 1) 325.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Société des Télécommunications Internationales Gabonaises (TIG)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Libreville
Lat.°	0.4N
Long.°	9.4E
°Long. Differ. Visible	77°
Eastern Limit for GSO	86°E
Western Limit for GSO	292°E (68°W)

■ GALAPAGOS ISLANDS (ECUADOR)

Range of Geostationary Satellites Visible

Location	Galapagos
Lat.°	0.0
Long.°	91.0W
°Long. Differ. Visible	77°
Eastern Limit for GSO	346°E (14°W)
Western Limit for GSO	192°E (168°W)

■ THE GAMBIA

Official name: Republic of The Gambia
Capital: Banjul
ITU country abbreviation: GMB
ITU Region: 1

International telephone dialing code: 220
International telex dialing code: 992

Demographic and Physical Information

Area: 11,300 km²
Population: 989,273
Major languages: English (official); Mandinka, Wolof
Time zones: GMT

Telecommunications Statistics

Number of telephones: 3,500
Submarine cable connections: none
Radio stations: 3 AM, 2 FM
Television standard: monochrome
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: NA
Television stations: NA
Television sets: 350,000
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

The Managing Director
Gamtel Company Limited
P. O. Box 387
Banjul, The Gambia
Telephone: +220 28822
Telex: 2208 mdgamtel gv
Fax: +220 26699

Officials

The Hon. Mr. Mathew Y. Baldeh, Minister of Works and Communications

Broadcasting Services

Information and Broadcasting Services
14 Hagan Street
Banjul, The Gambia
Telephone: +220 27230
Telex: 2204

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Banjul
Lat.°	13.5N
Long.°	16.7W
°Long. Differ. Visible	76°
Eastern Limit for GSO	59°E
Western Limit for GSO	267°E (93°W)

■ GEORGIA

Official name: Republic of Georgia
Capital: Tbilisi
ITU country abbreviation: GEO
ITU Region: 1

International telephone dialing code: 995
International telex dialing code: 0683

Demographic and Physical Information

Area: 69,700 km²
Population: 5.73 million
Major languages: Georgian (official), Russian
Time zones: GMT + 4h

Telecommunications Statistics

Number of telephones: 672,000
Submarine cable connections: none
Radio stations: NA
Television standard: SECAM
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministry of Telecommunication
9 April Street 2
Tbilisi 380008, Georgia
Telephone: 8832-984-343/294-900
Telex: 212911
Fax: 431-6029690

Official

Nodar Kharatishvili, First Deputy Minister

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Tbilisi
Lat.°	41.7N
Long.°	44.8E
°Long. Differ. Visible	71°
Eastern Limit for GSO	117°E
Western Limit for GSO	334°E (26°W)

■ GERMANY

Official name: Federal Republic of Germany (Note: still in the process of unifying the old east and west portions; telecommunications infrastructure greatly different between them)
Capital: Berlin (in several-year process of transferring from Bonn)
ITU country abbreviation: D
ITU Region: 1

International telephone dialing code: 49
International telex dialing code: 041

Demographic and Physical Information

Area: 356,910 km²
Population: 81.34 million
Major languages: German
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 40.3 million (west); 4 million (east)
Submarine cable connections: 6
Radio stations: 80 AM, 470 FM (west); 23 AM, 17 FM (east)
Television standard: West: VHF: PAL B; UHF: PAL G; East: VHF: SECAM B; UHF: SECAM G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 3
Private television networks: 5
Television stations: West: 246 (6,000 repeaters) East: 15 Russian repeaters
Television sets: West: 25 million; East: 6 million
TV households: NA
Cable penetration: 35%
VCR penetration: West: 29%; East: 7%
Satellite Earth stations: 12 Intelsat AOR antennas; 2 Intelsat IOR antennas; Intersputnik; 1 Eutelsat; Inmarsat AORE

Telecommunications Regulatory Organization

Der Bundesministerium für Post und Telekommunikation
Referat 201
Postfach 8001
D-5300 Bonn 1, Germany
Telephone: +49 228 140
Telex: 041-8861101 bpm d
Fax: +49 228 148872

Official
Dr. Wolfgang Bötsch, Minister of Posts and Telecommunications

Telecommunications Operator

Deutche Bundespost Telekom (DBT)
Generaldirektion, Fachbeteich 031
P. O. Box2000
D-5300 Bonn 2, Germany
5300 Bonn, Germany
Telephone: 228 1810
Telex: 041 886668 gdtd
Fax: 228 181 8872

Official
Helmut Ricke, President of Executive Committee

Broadcasting Services

Bayerischer Rundfunk (BR)
Rundfunkplatz 1
D-8000 Munich 2, Germany
Telephone: 89 59 00 01
Telex: 041-52107-0
Fax: 89 59 00 23 75

Deutche Welle (DW)
Raderberggurtel 50, Postfach 100444
D-5000 Cologne 51, Germany
Telephone: 221 389 0
Telex: 041 888 84 85
Fax: 221 389 3000

Deutchlandfunk
Raderberggurtel 40
5000 Cologne 51, Germany
Telephone: 0221 345 1
Telex: 8 88 49 20
Fax: 0221 38 07 66

Eins Plus
ARD German Television
Atnulfstr. 42
D-8000 München 2, Germany
Telephone: 89-5900-3280
Telex: 041 522480
Fax: 89-59-00-3249

Hessischer Rundfunk (HR)
Bertramstrasse 8, Postfah 3111
D-6000 Frankfurt 1, Germany
Telephone: 69 155 1
Telex: 041-41 11 27
Fax: 69 155 2900

Norddeutscher Rundfunk
Rothenbaunchaussee 132-134
D-2000 Hamburg 13, Germany
Telephone: 40-4131
Telex: 041 211989
Fax: 40-566-745

Premiere
Postfach 70 03 08
D-2000 Hamburg, Germany
Telephone: 40 69 44 50
Fax: 69 44 51 99

Pro 7 Television
Bahnhofstrasse 27a
D-8043 Unterföhring, Germany
Telephone: 89 95001 0
Telex: 5216461
Fax: 89 95001 230

Radioeuropa GmbH
Technipark, Postfach 540
D-5568 Daun, Germany
Telephone: 6592-2030
Telex: 041 4729961
Fax: 6592-203-202

RTL Plus
Aachener Strasse 1036
D-5000 Cologne, Germany
Telephone: 49 221 4560
Telex: 041-8886 328
Fax: 49 456 4290 / 456 4291

Sat 1
Hegel Strasse 61
D-6500 Mainz, Germany
Telephone: 61 313 800
Telex: 041-1761 31959
Fax: 61 380 100

3 Sat
P. O. Box 4040
D-6500 Mainz, Germany
Telephone: 6131 70 20 75
Fax: 6131 70 20 52

Spontkanal GmbH
Joseph-Dollinger Bogen 30
D-8000 München 40, Germany
Telephone: 89-323-307-276
Fax: 89-323-4700

Super Channel
Goethestr. 11/IV
D-8000 München 2, Germany
Telephone: 89-597-988
Fax: 89-554-190

Tele5
KMP mbH
Schellingstr. 44
D-8000 München 40, Germany
Telephone: 89-272-770
Telex: 041 17898988
Fax: 89-272-4970

Westdeutscher Rundfunk (WDR)
Appelhofplatz 1
D-5000 Cologne 1, Germany
Telephone: 221 220 1
Telex: 041-8 88 25 75
Fax: 221 220 4800

Zweites Deutsches Fernsehen (ZDF)
Essenheimer Strasse
P. O. Box 4040 D
D-6500 Mainz-Lerchenberg, Germany
Telephone: 6131 70 1
Telex: 041-4187 93 0 zdf d
Fax: 6131 70 21 57

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 14.51530%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Federal Ministry for Posts and Telecommunication
Ownership: 4.197863%
Earth stations:
Fuchstadt 1 (IOR major path 1) 63
Fuchstadt 2 (AOR primary) 335.5
Raisting 2 (AOR major path 1) 325.5
Raisting 4 (IOR primary) 60
Raisting 5 (AOR major path 2) 342
Usingen (AOR primary) 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Federal Ministry for Posts and Telecommunication
Ownership: 2.201%
Earth station:
Raisting (AORE)

International Organization of Space Communications (Intersputnik)

Domestic Satellite Network

Operator: Deutsche Bundespost Telekom
Telephone: 228-1810
Fax: 228 181-8872
Telex: 041-886668tdtd

Satellites:
DFS-1 Kopernicus 23.5°E
DFS-2 Kopernicus 28.5°E
DFS-3 Kopernicus 33.5°E
TV-SAT 2 19°W (BSS-TV)

Range of Geostationary Satellites Visible

Location	Berlin
Lat.°	52.5N
Long.°	13.4E
°Long. Differ. Visible	67°
Eastern Limit for GSO	81°E
Western Limit for GSO	306°E (54°W)

■ GHANA

Official name: Republic of Ghana
Capital: Accra
ITU country abbreviation: GHA
ITU Region: 1

International telephone dialing code: 233
International telex dialing code: 974

Demographic and Physical Information

Area: 238,540 km²
Population: 17.76 million
Major languages: English (official)
Time zones: GMT

Telecommunications Statistics

Number of telephones: 42,300
Submarine cable connections: none
Radio stations: 4 AM, 1 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 4 (8 translators)
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: 15%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Post and Telecommunications Corporation
Accra, Ghana
Telephone: +233 21 22 20 00
Telex: 3010 enghq gh
Fax: +233 21 66 79 79

Officials
Michael Kwaku Gbagonah, Director-General

Broadcasting Services

Ghana Broadcasting Corporation
P. O. Box 1633
Accra, Ghana
Telephone: +233 22 11 61 9
Telex: 2114

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Transport and Communications
Ownership: 0.089954%
Earth stations:
Nkutunse (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Accra
Lat.°	5.6N
Long.°	0.1W
°Long. Differ. Visible	76°
Eastern Limit for GSO	76°E
Western Limit for GSO	284°E (76°W)

■ GIBRALTAR (UNITED KINGDOM)

Status: dependent territory of the United Kingdom
ITU abbreviation: GIB
ITU Region: 1

International telephone dialing code: 350
International telex dialing code: 0405

Demographic and Physical Information

Area: 6.5 km²
Population: 31,874
Major languages: English, Spanish
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 9,400
Submarine cable connections: none
Radio stations: 1 AM, 6 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 4
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat (AOR major path)

Telecommunications Regulatory Organization

The Postmaster
General Post Office
Gibraltar
Telephone: 78320
Telex: 0405-2223 admsec gk

Broadcasting Services

Gibraltar Broadcasting Corporation
18 South Barrack Road
Gibraltar
Telephone: 79760
Telex:0405- 2229
Fax: 78673

Other Recognized Operators

Cable and Wireless Gibraltar
Telephone: 75955 (in U.K.: 71 492-3166)
Telex: 405 2207 (in U.K.: 0501-885121)

Earth station:
Gibraltar (AOR major path 2) 342

Range of Geostationary Satellites Visible

Location	Gibraltar
Lat.°	36.1N
Long.°	5.4W
°Long. Differ. Visible	73°
Eastern Limit for GSO	68°E
Western Limit for GSO	281°E (79°W)

■ GOUGH ISLAND

see St. Helena

■ GREAT BRITAIN

see United Kingdom

■ GREECE

Official name: Hellenic Republic
Capital: Athens
ITU country abbreviation: GRC
ITU Region: 1

International telephone dialing code: 30
International telex dialing code: 863

Demographic and Physical Information

Area: 131,940 km²
Population: 10.65 million
Major languages: Greek
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 4.08 million
Submarine cable connections: 8
Radio stations: 29 AM, 17 FM (20 repeaters)
Television standard: VHF: SECAM B; UHF: SECAM G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 5
Television stations: 361
Television sets: NA

TV households: NA
Cable penetration: NA
VCR penetration: 36%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR, 1Eutelsat

Telecommunications Regulatory Organization

Ministry of Transports and Communications
49 Avenue Syngrou
GR-11780 Athens, Greece
Telephone: 1 921-5279
Telex: 216369 ysyg gr
Fax: 1 923-7133

Officials

Panaghiotis Delimitsos, Minister of Transports and Communications
Iounnis Dimitracallis, General Secretary
Georged Antoniou, Director-General, Communications

Telecommunications Operator

OTE
99 Avenue Kifissias
Maroussi
GR-10246 Athens, Greece
Telephone: 1-882-7015
Telex: 0601 219797 ote gr 1)
Fax: 1-682-6499

Official

Prof. Dr. Dimitrias Kouremenos, Director General

Broadcasting Services

Greek Radio-Television (ERT)
P.O. Box 60019153 42 Aghia Paraskevi Attikis
Athens, Greece
Telephone: 1 638-03981
Telex: 0601 216066
Fax: 1 639-0652

Antenna TV Ant 1
10-12 Kifissias Ave.
151 25 Maroussi
Athens, Greece
Telephone: 1 685-0370
Telex: 224684 ant gr
Fax: 1 683-4349

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 0.05%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Hellenic Telecommunications Organization (OTE)
Ownership: 0.495059%
Earth stations:
Thermopylae 1 (IOR primary) 60
Thermopylae 2 (AOR primary) 335.5
Thermopylae 3 (AOR major path 2) 342

International Maritime Satellite Organization (Inmarsat)
Signatory: Hellenic Telecommunications Organization (OTE)
Ownership: 2.515%
Earth station:
Thermopylae (IOR)

Range of Geostationary Satellites Visible

Location	Athens
Lat.°	38.0N
Long.°	23.8E
° Long. Differ. Visible	73°
Eastern Limit for GSO	97°E
Western Limit for GSO	311°E (49°W)

GREENLAND

Status: part of Denmark
ITU abbreviation: DNK
ITU Region: 2

International telephone dialing code: 299
International telex dialing code: NA

Demographic and Physical Information

Area: 2.18 million km²
Population: 57,611
Major languages: Eskimo, Danish
Time zones: GMT - 1h - 3.30 h

Telecommunications Statistics

Number of telephones: 17,900
Submarine cable connections: 2
Radio stations: 5 AM, 7 FM (35 repeaters)
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: NA
Television stations: 4 (9 repeaters)
Television sets: NA
TV households: 14,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

see Denmark

Range of Geostationary Satellites Visible

Location	Thule
Lat.°	77.7N
Long.°	69.0W
° Long. Differ. Visible	0°
Eastern Limit for GSO	291°E (69°W)
Western Limit for GSO	291°E (69°W)

GRENADA

Official name: Grenada
Capital: Saint George's
ITU country abbreviation: GRD
ITU Region: 2

International telephone dialing code: 1+809
(to be changed to 473 at a future date)
International telex dialing code: NA

Demographic and Physical Information

Area: 340 km²
Population: 94,486
Major languages: English (official); French patois
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 5,650
Submarine cable connections: none
Radio stations: 1 AM
Television standard: NA
Electrical standard: 230 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization

Ministry of Works, Communications, Public Utilities, and Civil Aviation
Young Street
St. George's, Grenada
Telephone: +1 809 440-2271
Telex: 3418 minfin ga
Fax: +1 809 440-4122

Other Recognized Operators

Grenada Telecommunications Ltd (Grentel)
P. O. Box 119
St. George's, Grenada
Telephone: +1 809 440-1000
Telex: 3438 grentel ga
Fax: +1 809 440-4100

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	St. George's
Lat.°	12.1N
Long.°	61.7W
° Long. Differ. Visible	76°
Eastern Limit for GSO	14°E
Western Limit for GSO	222°E (138°W)

■ GUADELOUPE (FRANCE)

Status: overseas department of France
Capital: Basse-Terre
ITU abbreviation: none
ITU Region: 2

International telephone dialing code: 590
International telex dialing code: NA

Demographic and Physical Information

Area: 1,780 km²
Population: 402,815
Major languages: French
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 57,300
Submarine cable connections: none
Radio stations: 2 AM, 8 FM
Television standard: SECAM
Electrical standard: 220 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 9
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

see France

Broadcasting Services

Radio France d'Outre Mer

Earth station:
Trois Ilets (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Pointe-a-Pitre
Lat.°	16.3N
Long.°	61.7W
°Long. Differ. Visible	76°
Eastern Limit for GSO	14°E
Western Limit for GSO	222°E (138°W)

■ GUAM

Status: territory of the United States
Capital: Agana
ITU abbreviation: GUM
ITU Region: 3

International telephone dialing code: 671
International telex dialing code: 721

Demographic and Physical Information

Area: 541 km²
Population: 153,307
Major languages: English, Chamorro, Japanese
Time zones: GMT + 10h

Telecommunications Statistics

Number of telephones: 26,317
Submarine cable connections: none
Radio stations: 3 AM, 3 FM
Television standard: NTSC
Electrical standard: 110, 120 vac, 60 Hz
State-run television networks: none
Private television networks: 1
Television stations: 3
Television sets: 80,000
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations:
Finegayan (POR primary)
Pulantat (POR primary)

Telecommunications Regulatory Organization

Guam Telephone Authority
P. O. Box 9008
Tamuning, Guam 96911
Telephone: +671 646-6971
Telex: 013235 / 7216323

Broadcasting Services

Guam Television
P. O. Box 368
Agana, Guam 96910
Telephone: +671 477-9861

Earth Stations:
Finegayan (POR primary) 174
Pulantat 2 (POR primary) 174

Range of Geostationary Satellites Visible

Location	Guam
Lat.°	13.4N
Long.°	144.7E
°Long. Differ. Visible	76°
Eastern Limit for GSO	221°E
Western Limit for GSO	69°E

■ GUATEMALA

Official name: Republic of Guatemala
Capital: Guatemala
ITU country abbreviation: GTM
ITU Region: 2

International telephone dialing code: 502
International telex dialing code: 305

Demographic and Physical Information

Area: 108,890 km²
Population: 11.0 million
Major languages: Spanish, 23 Indian dialects
Time zones: GMT - 6h

Telecommunications Statistics

Number of telephones: 97,670
Submarine cable connections: none
Radio stations: 91 AM, 0 FM, 15 shortwave
Television standard: NTSC M
Electrical standard: 120 vac, 60 Hz
State-run television networks: 1
Private television networks: 4
Television stations: 25
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: 10%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministerio de Comunicaciones y Obras Publicas
Cuidad de Guatemala, Guatemala
Telephone: +502 2 83766

Officials

Excmo. Loc. Alvaro Hereda, Minister

Broadcasting Services

Radio Television Guatemala Canal 3
30 Ave. 3-40
Zona 11
Cuidad de Guatemala, Guatemala
Telephone: +502 2 94 74 91
Telex: 5253
Fax: +502 2 94 74 92

Teleonce Canal 11
20 Calle 5/02
Zona 10
A.P. 2825
Cuidad de Guatemala, Guatemala
Telephone: +502 2 68 22 21
Telex: 6030
Fax: +502 2 37 08 61

Televisiete SA Canal 7
2A Calle 18/07
Zona 15
Vista Hermosa 1
A.P. 1242
Cuidad de Guatemala, Guatemala
Telephone: +502 2 69 07 24
Telex: 6156
Fax: +502 2 69 39 71

Trecevision SA Canal 13
3A Calle 10/60
Zona 10
Cuidad de Guatemala, Guatemala
Telephone: +502 2 68 24 35
Telex: 6070
Fax: +502 2 37 08 61

Canal 5 TV Cultura y Educativa
4A Calle 18/38
Zona 1
Cuidad de Guatemala, Guatemala
Telephone: +502 2 53 19 61
Telex: 4159

Canal 21 de Television
6A Av. 12-20
Zona 7 Colonia Landivar
Cuidad de Guatemala, Guatemala
Telephone: +502 2 71 24 09

Canal 25
6A Av. 0-60
Zona 4
Edificio Torre Professional
oficinas 903/905
Cuidad de Guatemala, Guatemala
Telephone: +502 2 35 20 30
Fax: +502 35 30 05

Other Recognized Operators

Empresa Guatemalteca de Telecomunicaciones (Guatel)
7a Avenida 12 - 39 Zona 1
Cuidad de Guatemala, Guatemala
Telephone: +502 2 85898
Telex: 5333 geguat gu

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Guatemalteca de Telecomunicaciones (Guatel)
Ownership: 0.050000%
Earth stations:
Quetzal (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Guatemala
Lat.°	14.7N
Long.°	90.6W
°Long. Differ. Visible	76°
Eastern Limit for GSO	345°E (15°W)
Western Limit for GSO	193°E (167°W)

■ GUERNSEY (UNITED KINGDOM)

Official name: Bailiwick of Guernsey
Capital: Saint Peter Port

International telephone dialing code: NA
International telex dialing code: NA

Demographic and Physical Information

Area: 194 km²
Population: 64,353
Major languages: English, French

Telecommunications Statistics

Number of telephones: 41,900
Submarine cable connections: 1
Radio stations: 1 AM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Range of Geostationary Satellites Visible

Location	St. Peter Port
Lat.°	49.5N
Long.°	2.6W
°Long. Differ. Visible	69°
Eastern Limit for GSO	66°E
Western Limit for GSO	288°E (72°W)

■ GUINEA

Official name: Republic of Guinea
Capital: Conakry
ITU country abbreviation: GUI
ITU Region: 1

International telephone dialing code: 224
International telex dialing code: 995

Demographic and Physical Information

Area: 245,860 km²
Population: 6.55 million
Major languages: French
Time zones: GMT

Telecommunications Statistics

Number of telephones: 15,000
Submarine cable connections: none
Radio stations: 3 AM, 1 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: 65,000
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministère des Postes et Télécommunications
Conakry, Guinea
Telephone: +224 44 12 16
Telex: 22377 mpt ge

Officials
Fassou Claude Kourouma, Minister of Posts and Telecommunications
Abdourahamane Sylla, Secretary, National Committee for Telecom

Broadcasting Services

Radiodiffusion Television Guinéenne
B.P. 391
Conakry, Guinea
Telephone: +224 44 22 05

Ministère de l'Information et du Tourisme
Radiodiffusion Nationale
Conakry, Guinea
Telephone: +224 44 37 41
Telex: 22340

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Secretariat d'Etat aux Postes et Telecommunications
Ownership: 0.059877%
Earth stations:
Wonkifong (AOR major path 1) 325.5

Range of Geostationary Satellites Visible

Location	Conarky
Lat.°	9.5N
Long.°	13.8W
°Long. Differ. Visible	76°
Eastern Limit for GSO	62°E
Western Limit for GSO	270°E (90°W)

■ GUINEA-BISSAU

Official name: Republic of Guinea-Bissau
Capital: Bissau
ITU country abbreviation: GNB
ITU Region: 1

International telephone dialing code: 245
International telex dialing code: NA

Demographic and Physical Information

Area: 36,120 km²
Population: 1.12 million
Major languages: Portuguese (official); Criolo
Time zones: GMT

Telecommunications Statistics

Number of telephones: 3,000
Submarine cable connections: none
Radio stations: 2 AM, 3 FM
Television standard: NA
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministerio da Informaçao e das Telecomunicacoes
C. P. 200
Bissau, Guinea-Bissau
Telephone: +245 21 29 14
Telex: 250 publico bi

Officials

S.E. Moussa Djassi, Minister of Information and Telecommunications
Sotero Estanislau Andrade de Souza, Director-General, Posts and Telecommunications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Bissau
Lat.°	11.7N
Long.°	15.7W
°Long. Differ. Visible	76°
Eastern Limit for GSO	60°E
Western Limit for GSO	268°E (92°W)

GUYANA

Official name: Co-operative Republic of Guyana
Capital: Georgetown
ITU country abbreviation: GUY
ITU Region: 2

International telephone dialing code: 592
International telex dialing code: NA

Demographic and Physical Information

Area: 214,970
Population: 723,774
Major languages: English, Amerindian dialects
Time zones: GMT - 3h

Telecommunications Statistics

Number of telephones: <27,000
Submarine cable connections: none
Radio stations: 4 AM, 3 FM
Television standard: NTSC
Electrical standard: 110 vac, 50 Hz and 60 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

The Director of Telecommunications
P. O. Box 12174
68 Hadfield Street
Lodge
Georgetown, Guyana
Telephone: +592 2 63976
Fax: +592 2 67661

Officials

Keith Griffith

Broadcasting Services

Guyana Public Communications Agency
Homestretch Avenue
P. O. Box 1023
Georgetown, Guyana
Telephone: +592 2 62253 / 71566 / 71567
Fax: +592 2 72631

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Georgetown
Lat.°	6.8N
Long.°	58.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	18°E
Western Limit for GSO	225°E (135°W)

HAITI

Official name: Republic of Haiti
Capital: Port-au-Prince
ITU country abbreviation: HTI
ITU Region: 2

International telephone dialing code: 509
International telex dialing code: 329, 349

Demographic and Physical Information

Area: 27,750 km²
Population: 6.54 million
Major languages: French (official); Creole
Time zones: GMT - 5 h

Telecommunications Statistics

Number of telephones: 36,000
Submarine cable connections: none
Radio stations: 33 AM, 0 FM, 2 shortwave
Television standard: NTSC M
Electrical standard: 110 vac, 60 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 4
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Conseil National des Telecommunications (Conatel)
Boîte Postale 2002
Port-au-Prince, Haiti
Telephone: +509 22 03 00
Telex: conatel 2030353

Officials

Frantz Verella, Minister, Public Works, Transport, and Communications
Samuel Dubois, Director General, Conatel

Broadcasting Services

Tele Nationale d'Haiti (TNH)
P. O. Box 13400
Route de Delmas
31-33 Port-au-Prince, Haiti
Telephone: +509 01 50 200
Telex: 2030416

Tele Haiti
Harry Truman Blvd.
P. O. Box 1126
Port-au-Prince, Haiti
Telephone: +509 01 20 582 / 01 23 021
Fax: +509 01 29 140

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telecommunications d'Haiti S.A.
Ownership: 0.141379%
Earth stations:
Sabourin (AOR major path 1) 325.5

Range of Geostationary Satellites Visible

Location	Port-au-Prince
Lat.°	18.7N
Long.°	72.3W
°Long. Differ. Visible	76°
Eastern Limit for GSO	4°E
Western Limit for GSO	212°E (148°W)

HONDURAS

Official name: Republic of Honduras
Capital: Tegucigalpa
ITU country abbreviation: HND
ITU Region: 2

International telephone dialing code: 504
International telex dialing code: 311

Demographic and Physical Information
Area: 112,090 km²
Population: 5.46 million
Major languages: Spanish, Indian dialects
Time zones: GMT - 6h

Telecommunications Statistics
Number of telephones: 7 per 1,000 persons
Submarine cable connections: none
Radio stations: 176 AM, 0 FM, 7 shortwave
Television standard: NTSC M
Electrical standard: 110 vac, 60 Hz
State-run television networks: none
Private television networks: 9
Television stations: 28
Television sets: NA
TV households: 250,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization
Empresa Hondureña fr Telecomunicaciones (Hondutel)
Apartado Postal 1794
Tegucigalpa, Honduras
Telephone: +504 38 50 38
Telex: 3741343 gergen ho
Fax: +504 38 42 06

Officials
Marco Antonio Rosales Abella, Director General, Hondutel
Fernando Lezama, Deputy Director General

Broadcasting Services
Compania Televisora Hondureña Canal 5
Televicentro Telesistema Hondureño Canal 3 & 7
A.P. 734
Tegucigalpa, Honduras
Telephone: +504 32 55 14 / 32 14 75
Telex: 1126
Fax: +504 32 00 97

VICA H.R.J.S. TC Canal 2
9 Calle 10 Ave. N.D.#64
P. O. Box 120
San Pedro Sula, Honduras
Telephone: +504 52 76 60 / 52 76 61
Telex: 5716
Fax: +504 57 32 57

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Hondureña de Telecomunicaciones (Hondutel)
Ownership: 0.050000%
Earth stations:
Lempira 2 (AOR major path 1) 325.5

Range of Geostationary Satellites Visible

Location	Tegucigalpa
Lat.°	14.1N
Long.°	87.2W
° Long. Differ. Visible	76°
Eastern Limit for GSO	349°E (11°W)
Western Limit for GSO	197°E (163°W)

HONG KONG (UNITED KINGDOM)

Status: dependent territory of the United Kingdom (until 1 July, 1997)
Capital: Victoria
ITU abbreviation: HKG
ITU Region: 3

International telephone dialing code: 852
International telex dialing code: 780

Demographic and Physical Information
Area: 1,040 km²
Population: 5.6 million
Major languages: Cantonese, English
Time zones: GMT + 8h

Telecommunications Statistics
Number of telephones: 3 million
Submarine cable connections: 5
Radio stations: 6 AM, 6 FM
Television standard: UHF: PAL I
Electrical standard: 200 vac, 50 Hz
State-run television networks: none
Private television networks: 4
Television stations: 4
Television sets: 2 million
TV households: 1.3 million
Cable penetration: none
VCR penetration: 60%
Satellite Earth stations: 1 Intelsat POR, 2 Intelsat IOR

Telecommunications Regulatory Organization
The Postmaster General
General Post Office
Hong Kong
Telephone: +852 847-1111
Telex: 65958 gpohk hx
Fax: +852 868-0094

Broadcasting Services
Asia Television Ltd. (ATV)
81 Broadcast Drive
P. O. Box 1414
Kowloon, Hong Kong
Telephone: +852 339-9111
Telex: 44680
Fax: +852 338-0438

Television Broadcasts Ltd.
TV City
Clear Water Bay Road
Kowloon, Hong Kong
Telephone: +852 719-4828
Telex: 53059
Fax: +852 358-1325

Satellite Television Asian Region Ltd. (STAR TV)
Unit 107, Harbour Centre Tower 1
1 Hok Cheung Street
Hungham, Hong Kong
Telephone: +852 356-4108
Fax: +852 356-1442

Hong Kong Cable Communications Ltd.
19/F Guardian House
32 Oi Kwan Road
Wanchai, Hong Kong
Telephone: +852 831-1311
Fax: +852 834-8340 / 838-7555

Other Recognized Operators
Hong Kong Telecom International Ltd. (HKTI)
Cable and Wireless Hong Kong
GPO Box 597
Telecom House
3 Gloucester Road
Wanchai, Hong Kong
Telephone: +852 829-1111
Telex: 73240 cwadm hx
Fax: +852 824-3329

Hong Kong Telephone Company Ltd.
PO Box 9896
26/F, Office Tower, Convention Plaza
1 Harbour Road, Wanchai
Hong Kong
Telephone: +852 888 2888
Telex: 0802 73240 hktc hxx
Fax: +852 877-8877

Hutchison Telecommunications Ltd.
c/o Hutchison AT&T Network Services Ltd.
88 Gloucester Road
4/F China Underwriters Centre, Wanchai
Hong Kong

Officials
John Kyriaco, Hutchision Telecommunications Ltd.

Earth stations:
Hong Kong 1 (POR spare) 180
Hong Kong 2 (IOR major path) 63
Hong Kong 3 (IOR primary) 60
Hong Kong 4 (POR primary) 174

Range of Geostationary Satellites Visible

Location	Hong Kong
Lat.°	22.2N
Long.°	114.2E
°Long. Differ. Visible	75°
Eastern Limit for GSO	190°E
Western Limit for GSO	39°E

HUNGARY

Official name: Republic of Hungary
Capital: Budapest
ITU country abbreviation: HNG
ITU Region: 1
International telephone dialing code: 36
International telex dialing code: 061

Demographic and Physical Information

Area: 93,030 km²
Population: 10.32 million
Major languages: Hungarian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 1.52 million
Submarine cable connections: none
Radio stations: 32 AM, 15 FM
Television standard: VHF: SECAM D; UHF: SECAM K
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 41 (8 Russian repeaters)
Television sets: NA
TV households: 2.9 million
Cable penetration: 17%
VCR penetration: 17%
Satellite Earth stations: 1 Intelsat, 1 Intersputnik

Telecommunications Regulatory Organization

Ministry of Transport, Communications, and Water Management
P. O. Box 87
Budapest H-1400, Hungary
Telephone: 1 122-0220
Telex: 221144 prtmi h
Fax: 1 122-2818

Officials
Csaba Siklos, Minister of Transport, Communications, and Water Management
Imre Bolcskei, Head, Department of Telecommunications

Telecommunications Operator

Hungarian Telecommunications Co.
H-1541 Budapest, Hungary
Telephone: 1-155-0550
Telex: 061 221193
Fax: 1-156-0855

Official
Pál Horváth, Director General

Broadcasting Services

Magyar Televizio (MTV)
Szabadsag ter 17
Budapest 1810, Hungary
Telephone: 1 153-3200
Telex: 225568
Fax: 1 153-4568

Hungarian Broadcasting Company
P. O. Box 8
Budapest H-1541, Hungary
Telephone: 1 118-1233
Telex: 221144 prtmi h

Hungarian Radio
Budapest H-1800, Hungary
Telephone: 1 138-8388
Telex: 225362 mrhir h
Fax: 1 138-7004

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: NA
Ownership: NA
Earth stations: NA

International Organization of Space Communications (Intersputnik)

Range of Geostationary Satellites Visible

Location	Budapest
Lat.°	47.5N
Long.°	19.1E
°Long. Differ. Visible	70°
Eastern Limit for GSO	89°E
Western Limit for GSO	309°E (51°W)

IBIZA (SPAIN)

Range of Geostationary Satellites Visible

Location	Ibiza
Lat.°	38.9N
Long.°	1.4E
°Long. Differ. Visible	73°
Eastern Limit for GSO	74°E
Western Limit for GSO	288°E (72°W)

ICELAND

Official name: Republic of Iceland
Capital: Reykjavik
ITU country abbreviation: ISL
ITU Region: 1

International telephone dialing code: 354
International telex dialing code: 0501

Demographic and Physical Information

Area: 103,000 km²
Population: 265,998
Major languages: Icelandic
Time zones: GMT

Telecommunications Statistics

Number of telephones: 140,000
Submarine cable connections: NA
Radio stations: 5 AM, 147 FM (transmitters and repeaters)
Television standard: PAL B and PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 202 (transmitters and repeaters)
Television sets: 85,000
TV households: 76,000
Cable penetration: none
VCR penetration: 66%
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Posts and Telecommunications
IS-150
Reykjavik, Iceland
Telephone: 1 63 60 00
Telel: 0501 2000 gentel is
Fax: 1 63 60 09

Officials
Olafur Tomasson, Director of Posts and Telecommunications
Thorvardur Jonsson, Director of Technical Department

Broadcasting Services

Icelandic National Broadcasting Television (RUV)
Rikisutvarpio Sjonvarp
P. O. Box 150
105 Reykjavik, Iceland
Telephone: 1 69 39 00 / 69 39 88
Telel: 2045
Fax: 1 69 37 89 / 69 32 09

Icelandic Broadcasting Corporation
Krokhasl 6
Lynghals 5
Reykjavik, Iceland
Telephone: 1 67 22 55
Telex: 3111
Fax: 67 30 11

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 0.05%

International Telecommunication Union (ITU)

International Maritime Satellite Organization (Inmarsat) ownership 0.05%

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Iceland
Ownership: 0.171861%
Earth stations:
Skyggnir (AOR primary) 335.5
Skyggnir (AOR spare) 359

Range of Geostationary Satellites Visible

Location	Reykjavik
Lat.°	64.2N
Long.°	21.9W
°Long. Differ. Visible	58°
Eastern Limit for GSO	79°E
Western Limit for GSO	280°E (80°W)

■ INACCESSIBLE ISLAND

see St. Helena

■ INDIA

Official name: Repubic of India
Capital: New Delhi
ITU country abbreviation: IND
ITU Region: 3

International telephone dialing code: 91
International telex dialing code: 953

Demographic and Physical Information

Area: 3.29 million km²
Population: 936.6 million
Major languages: Hindi, English, 14 other official languages
Time zones: GMT + 5h30m

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: 3
Radio stations: 96 AM, 4 FM
Television standard: PAL B
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 274
Television sets: 50 million
TV households: 20 million
Cable penetration: 4%
VCR penetration: 25%
Satellite Earth stations: 3 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Communications
Sardar Patel Bhavan
Parliament Street
New Delhi 110001, India
Telephone: +91 11 35 06 07
Telex: 3161160 comn in
Fax: +91 11 374-6111

Officials
Sukh Rann, Minister of State for Communications
H.P. Wagle, Chairman, Telecommunications Commission andSecretary, Department of Telecommunications.

Broadcasting Services

All India Radio
Akashvani Bhavan
Parliament Street
New Delhi 110001, India
Telephone: +91 11 371-0058
Telex: 31 65585 dair in
Fax: +91 11 371-4061

Doordarshan India (TVI)
Doordarshan Bhawan
Copernicus Marg
Mandi House
New Delhi 110001, India
Telephone: +91 11 38 20 94
Telex: 31 66413
Fax: +91 11 38 65 07

India Vision
1501 B Kanti Apt.
Mount Mary Road, Bandra
Bombay, India
Telephone: +91 22 644-1212
Telex: 73484 seso in
Fax: +91 22 642-1299

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Videsh Sanchar Nigam Limited
Ownership: 1.877491%
Earth stations:
Ahkmed (IOR major path) 63
Vikram (IOR primary) 60

International Maritime Satellite Organization (Inmarsat)
Signatory: Videsh Sanchar Nigam Limited
Ownership: NA
Earth station:
Aarvi (IOR)

Domestic Satellite Network

Operator: Indian Department of Space
Telephone: +91 812 33 44 74
Telex: 0845-2499 / 0845-2326

Satellites:
Insat 1C 74°E
Insat 1D 82.9°E

Range of Geostationary Satellites Visible

Location	Bangalore
Lat.°	13.0N
Long.°	77.7E
°Long. Differ. Visible	76°
Eastern Limit for GSO	154°E
Western Limit for GSO	2°E

Location	Bombay
Lat.°	18.9N
Long.°	72.2E
°Long. Differ. Visible	76°
Eastern Limit for GSO	149°E
Western Limit for GSO	257°E (3°W)

Location	Calcutta
Lat.°	22.6N
Long.°	88.4E
°Long. Differ. Visible	75°
Eastern Limit for GSO	163°E
Western Limit for GSO	13°E

Location	New Delhi
Lat.°	28.6N
Long.°	77.2W
°Long. Differ. Visible	75°
Eastern Limit for GSO	152°E
Western Limit for GSO	2°E

■ INDONESIA

Official name: Republic of Indonesia
Capital: Jakarta
ITU country abbreviation: INS
ITU Region: 3

International telephone dialing code: 62
International telex dialing code: 796

Demographic and Physical Information

Area: 1.92 million km²
Population: 203.6 million
Major languages: Bahasa Indonesian (official); English, Dutch, Javanese
Time zones: GMT + 7h

Telecommunications Statistics

Number of telephones: 763,000
Submarine cable connections: NA
Radio stations: 618 AM, 38 FM
Television standard: PAL B
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 2
Television stations: 9
Television sets: 20 million
TV households: 20 million
Cable penetration: none
VCR penetration: 13%
Satellite Earth stations: 1 Intelsat IOR, 1 Intelsat POR

Telecommunications Regulatory Organization

Directorate Generral of Posts and Telecommunications (POSTEL)
Jalan Kebon Sirih 37
Jakarta 10340, Indonesia
Telephone: +62 21 34 60 00/6221 347000
Telex: 44407 postel ia
Fax: +62 21 310-2254

Officials

Djakana Puraawidjaya, Director General, POSTEL
Sri Slameto, Deputy Director General
Mr. Soegiharto, Deputy Director General for Telecommunications

Broadcasting Services

Radio Republik Indonesia
Jalan Medan Merdeka Barat
Barat No. 4-5
Jakarta 10160, Indonesia
Telephone: +62 21 37 75 08
Telex: 46154 tvri ia

Televisi Republik Indonesia (TVRI)
Jalan Gerbang Permuda
Senayan
Jakarta, Indonesia
Telephone: +62 21 58 2160
Telex: 073 46154 turijkt
Fax: +62 21 58 31 22

Other Recognized Operators

Directorate General of Sea Communications
Jalan Medan Merdeka
Timur No. 5
Jakarta 10110, Indonesia
Telephone: +62 21 34 87 98
Telex: 46117 djpl jkt
Fax: +62 21 34 44 92

PT Indonesia Satellite Corporation (PT INDOSAT)
Jalan Medan Merdeka Barat No. 21
P.O. Box 2905
Jakarta 10110, Indonesia
Telephone: +62 21 380-2614
Telex: 44383 indsat ia
Fax: +62 21 37 04 84

Perum Telekomunikasi (PERUMTEL)
Headquarters
Jalan Cisanggarung 2
Bandung 40115, Indonesia
Telephone: +62 22 43 61 00
Telex: 28220 diruttel ia
Fax: +62 22 44 03 13

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: PT Indosat
Ownership: 0.575707%
Earth stations:
Jatiluhur 1 (POR primary) 174
Jatiluhur 2 (IOR primary) 60

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: NA
Earth station: none

Domestic Satellite Network

Operator: PT Telekomunikasi Indonesia
Telephone: +62 21 520-3321
Fax: +62 21 520-3322
Telex: +62 21 60751

Satellites:
Palapa B1 118°E
Palapa B2P 113°E
Palapa B2R 108°E
Palapa B4 NA

Range of Geostationary Satellites Visible

Location	Jakarta
Lat.°	6.1S
Long.°	106.8E
°Long. Differ. Visible	76°
Eastern Limit for GSO	183°E
Western Limit for GSO	31°E

■ IRAN

Official name: Islamic Republic of Iran
Capital: Tehran
ITU country abbreviation: IRN
ITU Region: 1

International telephone dialing code: 98
International telex dialing code: 927

Demographic and Physical Information

Area: 1.65 million km²
Population: 64.63 million
Major languages: Persian, Turkic
Time zones: GMT + 3h30m

Telecommunications Statistics

Number of telephones: 2.14 million
Submarine cable connections: 1
Radio stations: 77 AM, 3 FM
Television standard: VHF: SECAM B; UHF: SECAM G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 28
Television sets: 5 million
TV households: 2.4 million
Cable penetration: none
VCR penetration: 33%
Satellite Earth stations: 2 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
P. O. Box 16314
Tehran, Iran
Telephone: +98 21 86 80 40
Telex: 212444 ptt ir
Fax: +98 21 860-1131

Officials

Sayed Mohammad Gharazi, Minister of Posts, Telegraph and Telephone
Hossein Shahabeddin, Deputy Minister for Telecommunications

Broadcasting Services

Islamic Republic of Iran Television
P. O. Box 19395-3333
Tajrish
Tehran, Iran
Telephone: +98 21 22 10 05
Telex: 213253

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telecommunications Company of Iran
Ownership: 0.773224%
Earth stations:
Isfahan (IOR major path) 63
Shahid Dr Gandy (IOR primary) 60
Tehran (AOR major path 2) 342

International Maritime Satellite Organization (Inmarsat)
Signatory: Telecommunications Company of Iran
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Tehran
Lat.°	35.6N
Long.°	51.5E
°Long. Differ. Visible	73°
Eastern Limit for GSO	125°E
Western Limit for GSO	339°E (21°W)

■ IRAQ

Official name: Republic of Iraq
Capital: Baghdad
ITU country abbreviation: IRQ
ITU Region: 1

International telephone dialing code: 964
International telex dialing code: 0491

Demographic and Physical Information

Area: 437,072 km²
Population: 20.64 million
Major languages: Arabic (official), Kurdish
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 632,000
Submarine cable connections: NA
Radio stations: 16 AM, 1 FM
Television standard: SECAM B
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 13
Television sets: NA
TV households: 620,000
Cable penetration: none
VCR penetration: 40%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR, 1 Intersputnik Atlantic, 1 Arabsat

Telecommunications Regulatory Organization

Iraqi Telecommunications and Posts
Karrada Dakhil
P. O. Box 2450
Baghdad, Iraq
Telephone: 1 718-0400
Telex: 0491 212002 comgen ik
Fax: 1 718-2125

Officials
Abdul Sattar Al-Ma'iini, Minister of Transport and Communications
Ghassan Abdul Razak Mostafa, Director-General, Posts and Telecommunications

Broadcasting Services

Iraqi Broadcasting and TV Establishment
Salhiya
Baghdad, Iraq
Telephone: 1 537-1151
Telex: 212246

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): Investment share 1.9%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Republic of Iraq
Ownership: 0.246610%
Earth stations:
Dujail 1 (IOR primary) 60
Dujail 2 (AOR primary) 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Government of the Republic of Iraq
Ownership: 0.05%
Earth station: none

Range of Geostationary Satellites Visible

Location	Baghdad
Lat.°	33.3N
Long.°	44.5E
°Long. Differ. Visible	74°
Eastern Limit for GSO	118°E
Western Limit for GSO	331°E (29°W)

■ IRELAND

Official name: Ireland
Capital: Dublin
ITU country abbreviation: IRL
ITU Region: 1

International telephone dialing code: 353
International telex dialing code: 0500

Demographic and Physical Information

Area: 70,280 km²
Population: 3.55 million
Major languages: Irish, English
Time zones: GMT

Telecommunications Statistics

Number of telephones: 900,000
Submarine cable connections: 2
Radio stations: 9 AM, 45 FM
Television standard: PAL I
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 86
Television sets: NA
TV households: 983,000
Cable penetration: 36%
VCR penetration: 38%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Department of Communications
Scotch House
Hawkins Street
Dublin 2, Ireland
Telephone: +353 1 71 82 11
Telex: 0500 25323 pthq ei
Fax: 1 79 88 34

Telecommunications Operator

Telecom Eireann
St. Stephen's reen West
Dublin 2, Ireland
Telephone: 1-714-444
Telex: 0500 91111
Fax: 1 752535

Broadcasting Services

Radio Telefis Eireann (RTE)
Donnybrook
Dublin 4, Ireland
Telephone: 1 64 31 11
Telex: 97300
Fax: 1 64 30 80

TV3
4 Windmill Lane
Dublin 2, Ireland
Telephone: 1 71 34 44
Telex: 30643
Fax: 1 71 84 13

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat)

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: The Irish Telecommunications Board
Ownership: 0.199898%
Earth stations:
Elfordstown (AOR major path 2) 342

Range of Geostationary Satellites Visible

Location	Dublin
Lat.°	53.3N
Long.°	6.3W
°Long. Differ. Visible	67°
Eastern Limit for GSO	73°E
Western Limit for GSO	299°E (61°W)

IRIAN JAYA (INDONESIA)

Range of Geostationary Satellites Visible

Location	Irian Jaya
Lat.°	4.0S
Long.°	137.0E
°Long. Differ. Visible	76°
Eastern Limit for GSO	213°E
Western Limit for GSO	61°E

ISRAEL

(Note: information here does not include occupied territories)

Official name: State of Israel
Capital: Jerusalem (de jure); Tel Aviv (de facto)
ITU country abbreviation: ISR
ITU Region: 1

International telephone dialing code: 972
International telex dialing code: 0606

Demographic and Physical Information

Area: 20,770 km²
Population: 5.43 million
Major languages: Hebrew (official), Arabic, English
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 1.8 million
Submarine cable connections: 3
Radio stations: 9 AM, 45 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 230 vac, 50 Hz
State-run television networks: 2
Private television networks: NA
Television stations: 20
Television sets: NA
TV households: 705,000
Cable penetration: 60%
VCR penetration: 60%
Satellite Earth stations: 2 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Communications
23 Yafo Road
91999 Jerusalem, Israel
Telephone: 2 23 02 22
Telex: 26381 gentel il
Fax: 2 24 030606 21

Officials

Moshe Shahal, Minister of Communications
Moshe Arad, Director General, Ministry of Communications

Telecommunications Operator

The Israeli Telecommunications Corp., Ltd. (Bezeq)
29 Yafo Road
P. O. Box 1088
Jerusalem 91010, Israel
Telephone: 2 39 53 33
Telex: 0606 25225 bezeq il
Fax: 2 24 11 02

Official

Isaac Kaul, President

Broadcasting Services

Israeli Broadcasting Authority Israel Television
Television House
P. O. Box 7193
Jerusalem 91071, Israel
Telephone: 2 30 13 33
Telex: 25301
Fax: 2 30 13 45

Israeli Channel 2
3 Kanfey Nasharim Road
Jerusalem 95464, Israel
Telephone: 2 51 12 21
Telex: 25678
Fax: 2 53 62 85

Israeli Educational TV
14 Klausner Street
Ramat-Aviv
Tel-Aviv 89011, Israel
Telephone: 3 42 77 67
Telex: 342325
Fax: 3 42 92 91

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Israeli Telecommunication Corp. Ltd. (Bezeq)
Ownership: 0.665429%
Earth stations:
Emeq Ha'ela 1 (AOR primary) 335.5
Emeq Ha'ela 2 (AOR major path 1) 325.5
Emeq Ha'ela 3 (IOR major path) 63

International Maritime Satellite Organization (Inmarsat)
Signatory: Israeli Telecommunication Company (Bezeq)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Jerusalem
Lat.°	31.8N
Long.°	35.2E
°Long. Differ. Visible	74°
Eastern Limit for GSO	106°E
Western Limit for GSO	321°E (39°W)

ITALY

Official name: Italian Republic
Capital: Rome
ITU country abbreviation: I
ITU Region: 1

International telephone dialing code: 39
International telex dialing code: 043

Demographic and Physical Information

Area: 301,230 km²
Population: 58.26 million
Major languages: Italian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 25.6 million
Submarine cable connections: 21
Radio stations: 135 AM, 28 FM (1,840 repeaters)
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 3
Television stations: 83 (1,000 repeaters)
Television sets: 36 million
TV households: 20 million
Cable penetration: NA
VCR penetration: 30%
Satellite Earth stations: 3 Intelsat AOR, 2 Intelsat IOR, Inmarsat, Eutelsat

Telecommunications Regulatory Organization

Ministero Poste e Telecomunicazioni
Ufficio Relazioni Internazionali
Viale America
I-00100 Rome EUR, Italy
Telephone: 6 594-2277
Telex: 616450 dgsegr i
Fax: 6 540-5890

Officials
Carlo Vizzini, Minister of Posts and Telecommunications
Enrico Veschi, Director-General, Posts and Telecommunications
Telecommunications Operators

Azienda di Stato per i
Servizi Telefonici (ASST)
Viale Europa 190
I-00100 Rome, Italy
Telephone: 6 54602900
Telex: 043 616094
Fax: 6 5415492

Official
Giuseppe Parrella, Director

Broadcasting Services

Radiotelevisione Italiana (RAI)
Viale Mazzini 14
Rome 00195, Italy
Telephone: 6 38781
Telex: 043 614432
Fax: 6 325-2757

RTI Canale 5
I-20090 Segrate
Palazzo di Cigni
Milan 2, Italy
Telephone: 2 2102 2241
Telex:043 316197
Fax: 2 2138 1145

Italia 7
Via Turati 3
Milan, Italy
Telephone: 2 657 1511
Fax: 2 659 8238

Odeon TV
Via Carlo Goldoni 39
Milan 20100, Italy
Telephone: 2 74 861
Telex: 043 43610654
Fax: 2 71 22 10

Telenova
Piazza Piemonte 2
Milan 20145, Italy
Telephone: 2 48 01 09 87
Fax: 2 4819 3378

Other Recognized Operators

Compagnia Generale Telemar
Viale Tiziano 19
I-00196 Rome, Italy
Telephone: 6 396 1200
Telex: 043 572121 telemari

Italcable
Servizi Cablografici, Radiotelegrafici, e
Radioelettrici S.p.A.
Via Calabria 46-48
I-00187 Rome, Italy
Telephone: 6 47701
Telex: 043 611146 itcdg i
Fax: 6 477 04282

Società Italiana per l'Esercizio delle
Telecomunicazioni p.a. (SIP)
Casella Postale AD 2420
Via Flaminia 189
I-00196 Rome, Italy
Telephone: 6 36881
Telex: 043 610467 sipgen i

Società Italiana radio maritima
Piazzale Guilio Douhet 25
I-00140 Rome, Italy
Telephone: 6 591 0441
Telex: 043 610293 sirm i

Telespazio S.p.A.
Via Tiburtina 965
I-00156 Rome, Italy
Telephone: 6 40 69 31
Telex: 043 620442
Fax: 6 40 69 36 24

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat): Investment share 8.10425%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Società Telespazio
Ownership: 2.475500%
Earth stations:
Fucino 1 (AOR major path 1) 325.5
Fucino 2 (IOR primary) 60
Fucino 3 (AOR primary) 335.5
Fucino 4 (AOR primary) 335.5
Lario 1 (AOR major path 2) 342
Lario 2 (IOR major path) 63

International Maritime Satellite Organization (Inmarsat)
Signatory: Società Telespazio
Ownership: 2.201%
Earth station:
Fucino (AORE)

Domestic Satellite Network

Operator: Telespazio
Telephone: 640-6931
Fax: 640-6936
Telex: 39 662-0424

Satellites:
Italsat 19.2°E

Range of Geostationary Satellites Visible

Location	Rome
Lat.°	41.0N
Long.°	12.5E
°Long. Differ. Visible	72°
Eastern Limit for GSO	84°E
Western Limit for GSO	300°E (60°W)

■ IVORY COAST

(see Côte d'Ivoire)

■ JAMAICA

Official name: Jamaica
Capital: Kingston
ITU country abbreviation: JMC
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: 387

Demographic and Physical Information

Area: 10,990 km²
Population: 2.57 million
Major languages: English, Creole
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 127,000
Submarine cable connections: 3
Radio stations: 10 AM, 17 FM
Television standard: NTSC M
Electrical standard: 110 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 8
Television sets: NA
TV households: 250,000
Cable penetration: none
VCR penetration: 44%
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Postal Headquarters
P.O. Box 7000, CSO, Kingston, Jamaica
Telephone:+1 809 922-9430
Fax +1 809 922-9499

Officials
The Hon. Robert Pickersgill, Minister of Public Utilities and Transport
Mr. Charles Bethune, Permanent Secretary, Ministry of Public Utilities and Transport
Mr. Bertram George Henry, Postmaster General
Mr. R. Humes, Chief Telcommunications Engineer

Aeronautical Telecommunication LTD
Norman Manely International Airport
Palisades P A
Kingston, Jamaica
Telephone: +1 809 928-6258
Fax: +1 809 924-8059

Broadcasting Services

Jamaica Broadcasting Corporation - Channel 7
P.O. Box 100, South Odeon Avenue, Kingston 10, Jamaica
Telephone:+1 809 926-5620
Fax: +1 809 929-1029
Telex: 2218

Radio Jamaica LTD.
5, South Odean Ave.
P.O. Box 100
Kingston 10, Jamaica
Telephone: +1 809 926-1100
Fax: +1 809 929-7467

Other Recognized Operators

Jamaica International Telecommunications LTD. (Jamintel)
15, North Street
P.O. Box 138, Kingston, Jamaica
Telephone: +1 809 922-6031
Fax: +1 809 921-5329
Telex: 291 2000

The Jamaica Telephone Co. LTD.
47, Half Way Tree Road
P.O. Box 21
Kingston 5, Jamaica
Telephone: +1 809 926-9700
Fax: +1 809 929-9784
Telex: 2184

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory:Jamaica International Telecommunications Limited (Jamintel)
Ownership: 0.379821%
Earth stations:
Prospect Pen 1 (AOR major path) 325.5
Prospect Pen 2 (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Kingston
Lat.°	18.0N
Long.°	76.8W
°Long. Differ. Visible	76°
Eastern Limit for GSO	359°E (1°W)
Western Limit for GSO	207°E (153°W)

■ JAN MAYEN ISLAND (NORWAY)

Range of Geostationary Satellites Visible

Location	Jan Mayen
Lat.°	71.0N
Long.°	9.0W
°Long. Differ. Visible	44°
Eastern Limit for GSO	35°E
Western Limit for GSO	307°E (53°W)

■ JAPAN

Official name: Japan
Capital: Tokyo
ITU country abbreviation: J
ITU Region: 3

International telephone dialing code: 81
International telex dialing code: 072

Demographic and Physical Information

Area: 377,835 km²
Population: 125.5 million
Major languages: Japanese
Time zones: GMT + 10h

Telecommunications Statistics

Number of telephones: 64 million
Submarine cable connections: several
Radio stations: 318 AM, 58 FM
Television standard: NTSC M
Electrical standard: 100 vac, 50 and 60 Hz
State-run television networks: 1
Private television networks: 5
Television stations: 12,350
Television sets: 100 million
TV households: NA
Cable penetration: 19%
VCR penetration: 72%
Satellite Earth stations:2 Intelsat IOR, 2 Intelsat POR,
1 Inmarsat IOR, 1 Inmarsat POR

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
3-2, Kasumigaseki 1-chome, Chiyoda-EJ,
Tokyo 100 100-90, Japan
Telephone:+81 3 35 04 792
Fax: +81 3 3509 5077

Officials
Junichiro Koizuma, Ministery of Posts and Communications; Tetsuo Morimoto, Vice-Minister of Posts and Communications

Broadcasting Services

Nippon Hoso Kyokai - NHK
Hoso Center, 2-2-1 Jinnan, Shibuya-Ku,
Tokyo 150, Japan
Telephone: +81 3 34 65 11 11 or 34 65 81 10;
Fax: +81 3 33 74 59 48
Telex: 22377

Nippon Minkan Hoso Renmei
(National Association of Commercial Broadcasters in Japan)
No 3, Kiocho, Chiyoda-Ku
Tokyo 100 Japan
Telephone: 81 3 32657 481

Asahi National Broadcasting Company - TV Asahi (ANB)
1-1-1 Roppongi, Minato-Ku, Tokyo 106, Japan
Telephone: +81 3 35 87 54 12 or 35 87 51 11
Fax: +81 3 35 03 35 39
Telex: 22520

Fuji Telecasting Network Inc. - FTN
3-1 Kadawa-Cho, Shijuku-Ku, Tokyo 162, Japan
Telephone: +81 3 33 53 111
Fax: +81 3 36 88 03 92
Telex: 25948

Nippon Television Network Corporation - NTV
14 Niban-Cho, Chiyoda-Ku, Tokyo 102, Japan
Telephone: +81 3 35275 1111
Fax: +81 3 32 63 60 08
Telex: 24566

Tokyo Broadcasting System Inc. - TBS
5-3-6 Akaska, Minato-Ku, Tokyo 107-06, Japan
Telephone: +81 3 35 84 31 11
Fax: +81 3 35 88 63 78
Telex: J23536 TBSINC

Mainichi Broadcasting System Inc. - MBS
17-1 Chayamachi, Kita-Ku, Osaka 530-04, Japan
Telephone: + 81 06 359-1123
Telex: J63445
Fax: +81 06 359-3503

TV Tokyo 12
4-3-12 Toranomon, Minayp-Ku, Tokyo 105, Japan
Telephone: +81 3 34 32 12 12
Telex: 28475
Fax: +81 3 35 78 01 83 or 32 30 41 60

Japan Satellite Broadcasting - JSB
1-22-15 Toranomon, Minato-kyu, Tokyo 105,
Japan
Telephone: +81 3 35 96 83 10
Fax: +81 3 35 01 53 17

Other Recognized Operators

DDI Corporation
Ichibancho FS Building
8, Ichiban-cho, Chiyoda-ku
Tokyo 102, Japan
Telephone: +813 3 32219551
Fax: +813 3 32219649

Global Van Japan Inc.
6 Rokubancho
Chiyoda-ku
Tokyo 102, Japan
Telephone: +81 3 32 21 61 31
Fax +81 3 32 21 61 32

International Digital Communications Inc.
6th Floor, Fujita Kanko Tranomon Bldg.
3-17-1 Toranomon
Minato-ku
Tokyo 105, Japan
Telephone: +81 3 54 70 51 41
Fax: +81 3 54 70 52 28
Telex: 2425667 idctyo j

International Telecom Japan Inc.
Tsukiji KY Bldg.
7-5, Tsukiji 4-chome
Chuo-ku
Tokyo 104, Japan
Telephone: +81 3 55 65 01 41
Fax: +81 3 55 65 00 07
Telex: +j28169 itj

Japan Telecom Co., Ltd.
1-7 Kudan-kita 4-chrome
Chiyoda-ku
Tokyo 104, Japan
Telephone: +81 3 32226681
Fax: +81 3 322226668

Kokusai Denshin Denwa Co. Ltd.
KDD Bldg.,P.O. Box No.1
3-2, Nishi-Shinjuku 2-Chome
Tokyo 163-03, Japan
Telephone: +81 3 33 47 71 11
Fax: +81 3 33 47 70 00
Telex: kddtokyo j22500

Network Information Sercies Co. Ltd.
28-25 I-chome Shinkawa
Chuo-ku
Tokyo 104, Japan
Telephone: +81 3 32 62 87 11
Fax: +81 3 32 62 87 57

Nippon Telegraph and Telephone Corp. (NTT)
No. 1-6, Uchisaiwai-cho 1-Chome
Chiyoda-ku
Tokyo 100
Japan
Telephone: +81 3 35 09 32 56
Telex: 2225300 ntt hq j

Nippon Hoso Kyokai
(Japan Broadcasting Corporation)
NHK Broadcasting Centre
2-2-1, Jinnan
Shibuya-ku
Tokyo 150, Japan
Telephone: +81 3 34651111
Telex: 072 radiohk j22377

Nippon Minkan Hoso Renmei
(National Association of Commercial Broadcasters in Japan)
No. 3, Kioicho, Chiyoda-ku
Tokyo 100, Japan
Telephone: +81 3 32657481

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Kokusai Denshin Denwa Company Ltd.
Ownership: 4.500624%
Earth stations:
Ibaraki 3 (POR spare) 180.0
Ibaraki 4 (POR primary) 174.0
Yamaguchi 2 (IOR primary) 60.0
Yamaguchi 3 (IOR major path) 63.0
Japan has 5 transportable Earth Networks.

International Maritime Satellite Organization (Inmarsat)
Signatory: Kokusai Denshin Denwa Company Ltd.
Ownership: NA
Earth station:
Yamaguchi (IOR)
Yamaguchi (POR)

Domestic Satellite Network

Operator: Japan Communications Satellite Company, Inc. (JCSat)
Telephone: +81 33 54 00 37 00
Fax: +81 33 34 37 66 20

Satellites:
Superbird NA
Operators: Telecommunications Satellite Corporation of Japan (TSCJ)

National Space Development Agency of Japan (NASDA)
Satellites:

BS-2B	110°E
BS-3A	110°E
BS-3B	110°E
CS-2A	126.5°E
CS-2B	128.5°E
CS-3A	128°E
CS-3B	132°E

Range of Geostationary Satellites Visible

Location	Kagoshima
Lat.°	31.6N
Long.°	130.5E
° Long. Differ. Visible	74°
Eastern Limit for GSO	205°E
Western Limit for GSO	57°E

Location	Sapporo
Lat.°	43.0N
Long.°	141.3E
° Long. Differ. Visible	71°
Eastern Limit for GSO	212°E
Western Limit for GSO	70°E

Location	Tokyo
Lat.°	35.7N
Long.°	139.7E
° Long. Differ. Visible	73°
Eastern Limit for GSO	213°E
Western Limit for GSO	67°E

■ JAVA (INDONESIA)

Range of Geostationary Satellites Visible

Location	Java
Lat.°	7.0S
Long.°	110.0E
° Long. Differ. Visible	76°
Eastern Limit for GSO	186°E
Western Limit for GSO	34°E

■ JERSEY (UNITED KINGDOM)

Official name: Bailiwick of Jersey
Status: British crown dependency
Capital: Saint Helier
ITU abbreviation: none
ITU Region: 1

International telephone dialing code: NA
International telex dialing code: 44-534

Demographic and Physical Information

Area: 117 km^2
Population: 86,649
Major languages: French, English (both official)
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 63,700
Submarine cable connections: 3
Radio stations: 1 AM
Television standard: PAL 1
Electrical standard: NA
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

Broadcasting Services

Channel Television
Television Centre, La Pouquelaye, St.Helier,
Jersey, Channel Island JE2 3ZD
Telephone: 0534 68999
Fax: 0534 59446

Range of Geostationary Satellites Visible

Location	Saint Helier
Lat.°	49.2N
Long.°	2.1W
°Long. Differ. Visible	69°
Eastern Limit for GSO	67°E
Western Limit for GSO	289°E (71°W)

■ JOHNSTON ATOLL (UNITED STATES)

Range of Geostationary Satellites Visible

Location	Johnston Island
Lat.°	17.2N
Long.°	169.1W
°Long. Differ. Visible	76°
Eastern Limit for GSO	245°E
Western Limit for GSO	93°E

■ JORDAN

Official name: Hashemite Kingdom of Jordan
Capital: Amman
ITU country abbreviation: JOR
ITU Region: 1

International telephone dialing code: 962
International telex dialing code: 0493

Demographic and Physical Information

Area: 89,213 km^2
Population: 4.11 million
Major languages: Arabic (official), English
Time zones: GMT +2h

Telecommunications Statistics

Number of telephones: 81,500
Submarine cable connections: several
Radio stations: 5 AM, 7 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 8
Television sets: NA
TV households: 285,000
Cable penetration: NA
VCR penetration: 36%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR, 1 Arabsat

Telecommunications Regulatory Organization

Telecommunications Corporation
P.O. Box 1689, Amman, Jordan
Telephone: 6 638301
Fax: 6 627776

Officials

Jamal Al-Sarayrah, Minister of Communications; Ahmad Nawawi, Director General, Telecommunications Corporation

Broadcasting Services

Jordon Radio and Television - JTV - Channel 2
P.O. Box 909, Amman
Telephone: 6 77 31 11
Fax: 6 74 46 62
Telex: +0493 6 23544 JTVINT JO

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): Investment share 4.05%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Hashemitte Kingdom of Jordan
Ownership: 0.279862%
Earth stations:
Baqa 1 (AOR primary) 60.0
Baqa 2 (IOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Amman
Lat.°	31.9N
Long.°	35.9E
°Long. Differ. Visible	74°
Eastern Limit for GSO	110°E
Western Limit for GSO	322°E (38°W)

■ KAZAKHSTAN

Official name: Republic of Kazakhstan
Capital: Almaty
ITU country abbreviation: KAZ
ITU Region: 1

International telephone dialing code: 7
International telex dialing code: 064

Demographic and Physical Information

Area: 2.72 million km^2
Population: 17.38 million
Major languages: Kazakh (official), Russian
Time zones: GMT + 5h

Telecommunications Statistics

Number of telephones: 2.2 million
Submarine cable connections: none
Radio stations: NA
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: Intelsat, Orbita

Telecommunications Regulatory Organization

Ministry of Communications
134 Bogenby Batyz Street
480091 Alma Ata, Kazakhstan

Official

Y. Nilov, Vice-Minister of Communications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Alma-Ata
Lat.°	43.2N
Long.°	76.9W
°Long. Differ. Visible	71°
Eastern Limit for GSO	148°E
Western Limit for GSO	6°E

KENYA

Official name: Republic of Kenya
Capital: Nairobi
ITU country abbreviation: KEN
ITU Region: 1

International telephone dialing code: 254
International telex dialing code: 0987

Demographic and Physical Information

Area: 582,650km²
Population: 28.82 million
Major languages: Swahili, English (both official)
Time zones: GMT +3h

Telecommunications Statistics

Number of telephones: 260,000
Submarine cable connections: none
Radio stations: 16 AM, 4 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 6
Television sets: NA
TV households: 390,000
Cable penetration: none
VCR penetration: 26%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Kenya Posts and Telecommunications Corporation
P.O. Box 30301, Nairobi, Kenya
Telephone:+254 2 2227401

Officials
Kipng'eno Arap Hg'eny, Managing Director; Hon. Dolmas Oriendo, Minister for Transport and Communications

Broadcasting Services

Kenya Broadcasting Corporation - KBC
Broadcasting House, Harry Thuku Road,
P.O. Box 30456, Nairobi, Kenya
Telephone: +254 2 33 45 67
Fax: +254 2 33 27 97
Telex: +0987 25361

Official
Ole Nasieku, Managing Director

Kenyan Television Network - KTN
P.O. Box 30958, Nairobi, Kenya
Telephone: +254 2 33 98 30
Fax: +254 2 21 44 67

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Kenya Posts and Telecommunications Corp. and/or Extelcoms Nairobi
Ownership: 0.328774%
Earth stations:
Longonot 1 (IOR primary) 60.0
Longonot 2 (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Nairobi
Lat.°	1.3S
Long.°	36.8E
°Long. Differ. Visible	76°
Eastern Limit for GSO	113°E
Western Limit for GSO	321°E (39°W)

KIRIBATI

Official name: Republic of Kiribati
Capital: Tarawa
ITU country abbreviation: KIR
ITU Region: 3

International telephone dialing code: 686
International telex dialing code: 0761

Demographic and Physical Information

Area: 717 km²
Population: 79,386
Major languages: English (official); Gilbertese
Time zones: GMT - 11h, GMT + 12h

Telecommunications Statistics

Number of telephones: 1,400
Submarine cable connections: none
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Telecom Services Kiribati Limited (TKSL)
P.O. Box 72
Bairiki Tarawa, Kiribati
Telephone: +686 21287
Fax: +686 21424

Officials
Uera Rabaua, Ministry of Communications; John Ikakeau Tangenibeia, Secretary of Communications; Robert Heron, Chief Executive Officer, TKSL

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
International Telecommunications Satellite Organization (Intelsat)
Signatory: NA
Ownership: NA
Earth stations: NA

Range of Geostationary Satellites Visible

Location	Tarawa
Lat.°	5S
Long.°	176E
°Long. Differ. Visible	76°
Eastern Limit for GSO	252°E
Western Limit for GSO	100°E

KOREA, NORTH

Official name: Democratic People's Republic of Korea
Capital: Pyongyang
ITU country abbreviation: KRE
ITU Region: 3

International telephone dialing code: 850
International telex dialing code: 0899

Demographic and Physical Information

Area: 120,540 km²
Population: 23.5 million
Major languages: Korean
Time zones: GMT + 8h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 18 AM
Television standard: PAL D
Electrical standard: NA
State-run television networks: 1
Private television networks: none
Television stations: 11
Television sets: 350,000
Television households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
Central District, Pyongyang, Korea, Democratic People's Republic
Telephone:+850 2 36344
Fax: +850 2 814418

Officials

Kim Hak Seub, Minister of Posts and Telecommunications; Chang Bong Jin, Vice-Minister of Posts and Telecommunications,; Chon Dok Chil, Vice-Minister of Posts and Telecommunications

Broadcasting Services

Korean Central TV Station
Ministry of Posts and Telecommunications
Central District, Pyongyang, Korea, Democratic People's Republic
Telephone:+850 2 36344
Fax: +850 2 81 44 18

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Deprelint Pyongyang
Ownership: NA
Earth stations:
Pyongyang (IOR primary) 60.0

International Organization of Space Communications (Intersputnik)

Range of Geostationary Satellites Visible

Location	Pyongyang
Lat.°	38.4N
Long.°	127.3E
°Long. Differ. Visible	73°
Eastern Limit for GSO	200°E
Western Limit for GSO	54°E

KOREA, SOUTH

Official name: Republic of Korea
Capital: Seoul
ITU country abbreviation: KOR
ITU Region: 3

International telephone dialing code: 82
International telex dialing code: 787

Demographic and Physical Information

Area: 98,480 km²
Population: 45.6 million
Major languages: Korean, English widely taught in high school
Time zones: GMT + 8h

Telecommunications Statistics

Number of telephones: 13.3 million
Submarine cable connections: none
Radio stations: 79 AM, 46 FM
Television standard: NTSC M
Electrical standard: 110 vac, 60 Hz
State-run television networks: 2
Private television networks: 1
Television stations: 256
Television sets: 12.5 million
TV households: 10.6 million
Cable penetration: none
VCR penetration: 40%
Satellite Earth stations: 1 Intelsat IOR, 2 Intelsat POR

Telecommunications Regulatory Organization

Ministry of Communications
100, Sejong-ro, Chongro-gu, Seoul 1 10-777, Korea
Telephone: +82 2 750-2222
Fax: +82 2 750-2915

Officials

Yoon Dong Yoon, Minister of Communications; Kyong Sang-Hyun, Vice-Minister of Communications

Broadcasting Services

Korean Broadcasting System - KBS
18 Yoido-Dong, Youngdungpo-Gu
Seoul 150, Korea
Telephone: +82 2 781-1000
Fax: +82 2 781-2499
Telex: +787 (801-US) 24599

Munhwa Broadcasting Corporation - MBC
31 Yoido-Dong, Youngdungpo-Gu
Seoul 150-728, Korea
Telephone: +82 2 784000
Fax: +84 2 782-3094
Telex: 787 (801-US) 22203

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Korea Telecom/KTA Souel
Ownership: 1.421507
Earth stations:
Boeun 1 (POR primary) 174.0
Boeun 2 (IOR major path) 63.0
Kum San 1 (POR spare) 186.0
Kum San 2 (IOR primary) 60.0
Kum San 3 (POR spare) 180.0

Other Recognized Operators

Korean Telecom
100 Sejong-ro, chong ro-gu
Seoul 110-770 Korea
Telephone: 822 2750 3816
Fax: 822 2 750 3830

International Maritime Satellite Organization (Inmarsat)
Signatory: Korea Telecom
Ownership: NA
Earth station:
Kum San (POR)

Range of Geostationary Satellites Visible

Location	Seoul
Lat.°	37.5N
Long.°	127E
°Long. Differ. Visible	73°
Eastern Limit for GSO	200°E
Western Limit for GSO	54°E

KOSOVO

see Yugoslavia

KUWAIT

Official name: State of Kuwait
Capital: Kuwait
ITU country abbreviation: KWT
ITU Region: 1

International telephone dialing code: 965
International telex dialing code: 0496

Demographic and Physical Information

Area: 17,820 km²
Population: 1.82 million
Major languages: Arabic (official), English
Time zones: GMT +3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 3 AM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 3
Television sets: NA
TV households: 680,000
Cable penetration: none
VCR penetration: 86%
Satellite Earth stations: destroyed in Gulf War

Telecommunications Regulatory Organization

Ministry of Communications
P.O. Box 318,11111 Safat, Kuwait
Telephone: 81 90 33
Fax: 481-8696

Officials

Habib Jawhar Hayat, Minister of Communications; Khalid Abdullateef Al-Houti, Under Secretary for Subscriber Services; Adel Abdulaziz Al-Ibrahim, Director of International Network; Ibrahim Askar Saud, Director of Tender Section; Mr. Khalid Ashoor Al-Marzook, Director of Operations and Traffic; Fadhel Abu Al-Hassan, Director of Telegraph and Telephone

Broadcasting Services

Kuwait Television - KTV
P.O. Box 193, Al Safat 13002, Kuwait
Telephone: 241 5300 or 5301
Fax: 243 8610
Telex: +959 22030

Other Recognized Operators

Mobile Telephone Systems Co. (K.S.C.)
P.O. Box 22244
Safat 13083, Kuwait
Telephone: +965 246-7200
Fax: 245-5444
Telex: 0496 30444 Hatef kt

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): investment share 14.59%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: USPTT Kuwait
Ownership: NA
Earth stations:
Kuwait (AOR major path) 342.0
Kuwait (AOR primary) 335.5
Kuwait (IOR primary) 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: 0.72143%
Earth station: NA

Range of Geostationary Satellites Visible

Location	Kuwait
Lat.°	29.5N
Long.°	47.5E
°Long. Differ. Visible	74°
Eastern Limit for GSO	122°E
Western Limit for GSO	334°E (26°W)

KYRGYZSTAN

Official name: Kyrgyz Republic
Capital: Bishkek
ITU country abbreviation: KGZ
ITU Region: 1

International telephone dialing code: 7
International telex dialing code: 0788

Demographic and Physical Information

Area: 198,500 km²
Population: 4.77 million
Major languages: Kirghiz (official); Russian
Time zones: GMT + 6h

Telecommunications Statistics

Number of telephones: 342,000
Submarine cable connections: none
Radio stations: NA
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: 875,000
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat, 1 Gorizont

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Bishkek
Lat.°	42.9N
Long.°	74.8E
°Long. Differ. Visible	71°
Eastern Limit for GSO	146°E
Western Limit for GSO	4°E

LAOS

Official name: Lao People's Democratic Republic
Capital: Vientiane
ITU country abbrevition: LAO
ITU Region: 3

International telephone dialing code: 856
International telex dialing code: 715

Demographic and Physical Information

Area: 236,800 km²
Population: 4.8 million
Major languages: Lao (official); French, English
Time zones: GMT + 7h

Telecommunications Statistics

Number of telephones: 7,390
Submarine cable connections: none
Radio stations: 10 AM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: 35,000
TV households: 35,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1

Telecommunications Regulatory Organization

Ministere des Communications, Transports, Postes et de la Construction
Departement des Postes et Telecommunications, rue Jawaharlal Nehru, 0100 Vientiane, Laos
Telephone: + 856 4599

Officials

S.E.M. Bouathong, Ministre des Communications

Enterprise d'Etat des Postes et
Télécommunications Laos (EPTL)
Avenue Lane Xang
Vientiane, Laos (R.d.dp.)
Telephone: +856 4317
Telex: 4317

Officials

Xieng Sone Phila, Director General EPTL

Broadcasting Services

Loas National TV - LTV
P.O. Box 310 Ventiane, Loas
Telephone: +856 5075

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: EPTL Laos
Ownership: NA
Earth stations:NA

International Organization of Space Communications (Intersputnik)

Range of Geostationary Satellites Visible

Location	Vientiane
Lat.°	18N
Long.°	102.6E
°Long. Differ. Visible	76°
Eastern Limit for GSO	178°E
Western Limit for GSO	26°E

■ LATVIA

Official name: Republic of Latvia
Capital: Riga
ITU country abbreviation: LVA
ITU Region: 1

International telephone dialing code: 371
International telex dialing code: 0538

Demographic and Physical Information

Area: 64,100 km²
Population: 2.76 million
Major languages: Lettish (official); Lithuanian, Russian)
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 660,000
Submarine cable connections: NA
Radio stations: NA
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministry of Transport
Department of Communications
41/43 Elizabetes Street
LV-1010 Riga, Latvia
Telephone: 2-33157
Telex: 0538 161176
Fax: 2-325054/331920

Officials

H.E. Andris Gutmanis, Minister of Transport
Ilgvars Gulbis, Director, Department of Communications

Telecommunications Operator

Lattelekom
41/43 Elizabetes Street
LV-1010 Riga, Latvia
Telephone: 8-828-000
Telex: 0538 161176
Fax: 8-828-001

Broadcasting Services

Latvian Television - LT
3 Zakusalas, Riga 1018, Latvia
Telephone: +731 20 00 25

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: NA
Ownership: NA
Earth stations: NA

Range of Geostationary Satellites Visible

Location	Riga
Lat.°	56.9N
Long.°	224.1E
°Long. Differ. Visible	65°
Eastern Limit for GSO	89°E
Western Limit for GSO	319°E (41°W)

■ LEBANON

Official name: Republic of Lebanon
Capital: Beirut
ITU country abbreviation: LBN
ITU Region: 1

International telephone dialing code: 961
International telex dialing code: 0494

Demographic and Physical Information

Area: 10,400 km²
Population: 3.7 million
Major languages: Arabic, French (both official)
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 325,000
Submarine cable connections: 3
Radio stations: 5 AM, 3 FM
Television standard: VHF: SECAM B; UHF: SECAM G
Electrical standard: 110 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: AN
Television stations: 13
Television sets: NA
TV households: 520,000
Cable penetration: none
VCR penetration: 66%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat POR

Telecommunications Regulatory Organization

Ministere des Postes et des Telecommunications
Departement des Postes et Telecommunications,
Avenue Sami el Solh, Beirut, Lebanon
Telephone: 1 389800
Fax: 1 888600

Officials

Mohamed Ghaziri, Minister of Posts and Telecommunications; M. Elie Eid, Director-General, Telecommunication Operation and Maintenance; Khodr Mansour, Director-General, Telecommunication Equipment & Construction.

Broadcasting Services

Tele-Liban
P.O. Box 11, 5054 Hazmieh, Beruit, Lebanon
Telephone: 1 42 49 12
Fax: 1 45 72 51
Telex: 923 20100

Other Recognized Operators

O.G.E.R.O.
Organisme de Gestion et d' Exploitation des Installations et des Equipements de l'ex-Société Radio-Oreint
Boîte postale 1226
Hôtel des PTT
Beyrouth, Lebanon
Telephone: 1 22 01 85
Telex: 0494 torct1 29139 le

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): Investment share 3.83%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Lebanon/PTT Beirut
Ownership: 0.050000%
Earth stations: Joret el Ballout (AOR major path) 342.0

Range of Geostationary Satellites Visible

Location	Beirut
Lat.°	33.9N
Long.°	35.5
°Long. Differ. Visible	74°
Eastern Limit for GSO	109°E
Western Limit for GSO	322°E (38°W)

■ LESOTHO

Official name: Kingdom of Lesotho
Capital: Maseru
ITU country abbreviation: LSO
ITU Region: 1

International telephone dialing code: 266
International telex dialing code: NA

Demographic and Physical Information

Area: 30,350 km²
Population: 1.99 million
Major languages: English (official); Sesotho
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 5,920
Submarine cable connections: none
Radio stations: 3 AM, 4 FM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 5,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Lesotho Telecommunications Corporation
P.O. Box 1037, Mesuru 100, Lesotho
Telephone: +266 1 21 10 00

Officials
L. Mohapeloa, Managing Director, Lesotho

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Maseru
Lat.°	29.3S
Long.°	27.5E
° Long. Differ. Visible	74°
Eastern Limit for GSO	102°E
Western Limit for GSO	314°E (46°W)

LIBERIA

Official name: Republic of Liberia
Capital: Monrovia
ITU country abbreviation: LBR
ITU Region: 1

International telephone dialing code: 231
International telex dialing code: 937

Demographic and Physical Information

Area: 111,370 km²
Population: 3.07 million
Major languages: English (official)
Time zones: GMT

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 3 AM, 4 FM
Television standard: PAL B
Electrical standard: 120 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 5
Television sets: NA
TV households: 60,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
Monrovia, Liberia
Telephone: +231 223208
Fax: +231 223331

Officials
Roosevelt Gasolin Jayjay, Coordinator, Posts and Telecommunications

Broadcasting Services

Liberia Broadcasting System
P.O. Box, Monrovia, Liberia
Telephone: +231 27 12 50
Telex: +937 44249

Other Recognized Operators

Liberia Telecommunications Corporation
Lynch Street, Telecommunications Bldg.
Mail Bag No. 9039
Monrovia, Liberia
Telephone: +231 22 22 22
Telex: +44330 telecom li

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Singatory: Libtelco Monrovia
Ownership: NA
Earthstations: Wehn Town (Aor Major path 1) 325.5

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Monrovia
Lat.°	6.3N
Long.°	10.8W
° Long. Differ. Visible	76°
Eastern Limit for GSO	87°E
Western Limit for GSO	295°E (65°W)

LIBYA

Official name: Socialist People's Libyan Arab Jamahiriya
Capital: Tripoli
ITU country abbreviation: LBY
ITU Region: 1

International telephone dialing code: 218
International telex dialing code: 0901

Demographic and Physical Information

Area: 1.76 million km²
Population: 5.25 million
Major languages: Arabic, Italian, English
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 370,000
Submarine cable connections: 2
Radio stations: 17 AM, 3 FM
Television standard: SECAM B
Electrical standard: 127 and 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 12
Television sets: NA
TV households: 300,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

General Posts and Telecommunications Co.
Tripoli, Libya
Telephone: 21 605406
Telex: 0901 20000

Officials
Imbarek A. Alshamaki, Secretary for Communications and Marine Transport; A. Al-Kredly, Chairman, General Posts and Telecommunications; M. Ghawi, Head, International Relations Office

Broadcasting Services

Lybian Jamahirya Broadcasting
P.O. Box 333, Tripoli, Libya
Telephone: 21 32 451 or 32 454
Telex: 0901 20010

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat); investment shae 11.28%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Libya/PTC Tripoli
Ownership: 0.148688%
Earth stations:
Tripoli 2 (AOR Primary) — 335.5
Tripoli 3 (IOR primary) — 60.0

Range of Geostationary Satellites Visible

Location	Tripoli
Lat.°	32.8N
Long.°	13.1E
°Long. Differ. Visible	74°
Eastern Limit for GSO	90°E
Western Limit for GSO	299°E (61°W)

■ LIECHTENSTEIN

Official name: Principality of Liechtenstein
Capital: Vaduz
ITU country abbreviation: LIE
ITU Region: 1

International telephone dialing code: 41
International telex dialing code: 045

Demographic and Physical Information

Area: 160 km²
Population: 30,654
Major languages: German (official)
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 25,400
Submarine cable connections: none
Radio stations: NA
Television standard: PAL 9
Electrical standard: 220 vac, 50Hz
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Office pour les Affires Etrangeres
Heiligkreuz 14, FL-9490 Vaduz, Liechtenstein
Telephone: 75 236-6058
Fax: 75 236-6059

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Liechtenstein
Ownership: 0.050000%
Earth stations: NA

Range of Geostationary Satellites Visible

Location	Vaduz
Lat.°	47.1N
Long.°	9.5E
°Long. Differ. Visible	70°
Eastern Limit for GSO	79°E
Western Limit for GSO	300°E (60°W)

■ LITHUANIA

Official name: Republic of Lithuania
Capital: Vilnius
ITU country abbreviation: LTU
ITU Region: 1

International telephone dialing code: 370
International telex dialing code: 0539

Demographic and Physical Information

Area: 65,200 km²
Population: 3.88 million
Major languages: Lithuanian (official); Polish, Russian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 900,000
Submarine cable connections: NA
Radio stations: 13 AM, 26 FM, 1 shortwave, 1 longwave
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 3
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Eutelsat, 1 Intelsat

Telecommunications Regulatory Organization

Ministry of Communications and Informatics
Vilniaus g.33
2008 Vilnius, Lithuania
Telephone: 012-620443
Telex: 0539 261166
Fax: 012-225-070

Official
G. Zintelis, Minister of Communications and Informatics

Broadcasting Services

Lithuanian Radio & Television
49 S. Konarskio, 2674 Vilnius, Lithuania
Telephone: (012-2) 26 33 83
Fax: (012-2) 26 32 82
Telex: 261 151 LITVR

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Vilnius
Lat.°	54.6N
Long.°	29.3E
°Long. Differ. Visible	66°
Eastern Limit for GSO	96°E
Western Limit for GSO	323°E (37°W)

■ LUXEMBOURG

Official name: Grand Duchy of Luxembourg
Capital: Luxembourg
ITU country abbreviation: LUX
ITU Region: 1

International telephone dialing code: 352
International telex dialing code: 0402

Demographic and Physical Information

Area: 2,586 km²
Population: 404,660
Major languages: Luxembourgisch, German, French, English
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 230,000
Submarine cable connections: 3
Radio stations: 2 AM, 3 FM
Television standard: VHF: PAL B; UHF: PAL G and SECAM L
Electrical standard: 220 vac, 50 Hz
State-run television networks: none

Private television networks: 4
Television stations: 3
Television sets: NA
TV households: 139,000
Cable penetration: 90%
VCR penetration: 64%
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Direction General des Postes et des Telecommunications
8a, avenue Monterey, L-2020 Luxembourg

Officials
Edmond Toussing, Director General

Broadcasting Services

Compagnie Luxembourgeoise de Télédiffusion (CLT)
L-2850 Luxembourg 1010
Telephone: 47 66 29 33
Fax: 47 66 27 30
Telex: 0402 848 3453

Other Recognized Operators

Société Européene des Satellites (S.E.S)
Chateau de Betzdorf
L - 6832 Betzdorf, Luxembourg
Telephone: 71 72 51
Fax: 71 72 52 27
Telex: 040260625 astra lu

Official
Dr. Pierre Mlyrat, Director General

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Luxembourg
Ownership: 0.050000%
Earth stations: none

Domestic Satellite Network

Operator: Société Européenne des Satellites (SES, Astra)
Telephone: 71 72 51
Fax: 71 72 52 27

Satellites:
Astra 1A 19.2°E
Astra 1B 19.2°E
Astra 1C 19.2°E

Range of Geostationary Satellites Visible

Location	Luxembourg
Lat.°	49.7N
Long.°	6.0E
°Long. Differ. Visible	69°
Eastern Limit for GSO	75°E
Western Limit for GSO	297°E(63°W)

MACAU (PORTUGAL)

Status: overseas territory of Portugal (until 1999)
Capital: Macau
ITU abbreviation: MAC
ITU Region: 1

International telephone dialing code: 853
International telex dialing code: 797

Demographic and Physical Information

Area: 16 km²
Population: 490,901
Major languages: Portuguese (official); Cantonese
Time zones: GMT + 8h

Telecommunications Statistics

Number of telephones: 52,000
Submarine cable connections: NA
Radio stations: 4 AM, 3 FM
Television standard: PAL
Electrical standard: 200 vac, 50 Hz
State-run television networks: none
Private television networks: 1
Television stations: none
Television sets: NA
TV households: 150,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Direccao dos Servicos de Correios e Telecomunicacoes, CTT
Largo do Senado
Macau
Telephone: +853 574491
Fax: +853 336603
Telex; 88230 cttma om

Broadcasting Services

Teledifussao de Macau, S.A.R.L.
Caixa Postal 466, Macau
Telephone: +853 550152
Fax: +853 310590
Telex: +88309 radio om

Other Recognized Operators

Companhia de Telecommunicacoes de Macau, S.A.R.L.
Caixa postal 868, Macau
Telephone: +853 552211
Fax: +853 593107
Telex: 88399 tmmac om

Range of Geostationary Satellites Visible

Location	Macau
Lat.°	22.3N
Long.°	113.6E
°Long. Differ. Visible	75°
Eastern Limit for GSO	189°E
Western Limit for GSO	39°E

MACEDONIA

Official name: The former Yugoslav Republic of Macedonia
Capital: Skopje
ITU country abbreviation: MKD
ITU Region: 1

International telephone dialing code: 389
International telex dialing code: 062

Demographic and Physical Information

Area: 25,333 km²
Population: 2.16 million
Major languages: Macedonian, Albanian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 125,000
Submarine cable connections: none
Radio stations: 6 AM, 2 FM
Television standard: PAL
Electrical standard: 220 Vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 5 (2 relays)
Television sets: 325,000
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

International Telecommunications Organization Membership

International Telecommunications Union (ITU)

Range of Geostationary Satellites Visible

Location	Skopje
Lat.°	42.0N
Long.°	21.5E
°Long. Differ. Visible	72°
Eastern Limit for GSO	93°E
Western Limit for GSO	310°E (50°W)

MADAGASCAR

Official name: Republic of Madagascar
Capital: Antananarivo
ITU country abbreviation: MDG
ITU Region: 1

International telephone dialing code: 261
International telex dialing code: 983

Demographic and Physical Information

Area: 587,040 km²
Population: 13.86 million
Major languages: Malagasy, French (both official)
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: 1
Radio stations: 17 AM, 3 FM
Television standard: SECAM K1
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1 (36 repeaters)
Television sets: NA
TV households: 350,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministere des Postes et des Telecommunications
Antaninarenina, Antananarivo, Madagascar
+265 2 6121

Officials

Simon Pierre, Minister of Posts and Telecommunications; Marvel Aime, Secretary General, Posts and Telecommunications

Broadcasting Services

Radio Television Malagasy
P.O. Box 422, Antananarivo, Madagascar
Telephone: +261 2 21 784
Telex: +983 22302

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Société des Telecommunications Internationales de la Republique Malgache (STIMAD)
Ownership: 0.050000%
Earth stations:
Philibert Tsiranana (IOR primary) 60.0

Range of Geostationary Satellites Visible

Location	Antananarivo
Lat.°	18.9S
Long.°	47.5E
°Long. Differ. Visible	76°
Eastern Limit for GSO	123°E
Western Limit for GSO	332°E (28°W)

MADEIRA (PORTUGAL)

Range of Geostationary Satellites Visible

Location	Funchal
Lat.°	32.8N
Long.°	17W
°Long. Differ. Visible	74°
Eastern Limit for GSO	57°E
Western Limit for GSO	269°E (91°W)

MALAWI

Official name: Republic of Malawi
Capital: Lilongwe
ITU country abbreviation: MWI
ITU Region: 1

International telephone dialing code: 265
International telex dialing code: NA

Demographic and Physical Information

Area: 118,480 km²
Population: 9.81 million
Major languages: Chichewa, English (both official)
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 42,250
Submarine cable connections: none
Radio stations: 10 AM, 17 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 230 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Transport and Communications
Postal Bag 322, Capital City, Lilongwe 3, Malawi
+265 730122

Officials

D. Katopola, Minister of Transport and Communications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Department of Posts and Telecommunications
Ownership: 0.112693%
Earth stations: NA

Range of Geostationary Satellites Visible

Location	Lilongwe
Lat.°	14S
Long.°	33.8E
°Long. Differ. Visible	76°
Eastern Limit for GSO	110°E
Western Limit for GSO	26°E

MALAYSIA

Official name: Malaysia
Capital: Kuala Lumpur
ITU country abbreviation: MLA
ITU Region: 3

International telephone dialing code: 60
International telex dialing code: 784

Demographic and Physical Information

Area: 329,750 km²
Population: 19.8 million
Major languages: Malay (official); English, Chinese
Time zones: GMT + 8h

Telecommunications Statistics

Number of telephones: 994,860
Submarine cable connections: 2
Radio stations: 28 AM, 3 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 33
Television sets: 3 million
TV households: 2.5 million
Cable penetration: none
VCR penetration: 43%
Satellite Earth stations: 2 Intelsat IOR, 2 Intelsat POR

Telecommunications Regulatory Organization

Jabatan Telekom Malaysia (JTM)
Ministry of Energy, Telecommunications
Wisma Damansra, Jalan Semantan, 50668 Kuala Lumpur, Malaysia
Telephone: +60 3 255-6687
Fax: +60 3 255-7901

Officials

Dato' Seri S. Samy Vellu, Minister, Haji ato'Mohd Tojot Roslli Ghazwi, Deputy Minister, Haji Mohamed Ali Yusoff, Director General, JTM; Haji Mohamed Anuar Khalid, Deputy Director-General, JTM

Broadcasting Services

Radio Television Malaysia - RTM
Department of Broadcasting
Angkasapuri 50610 Kuala Lumpur, Malaysia
Telephone: +60 3 274 5333
Fax: +60 3 282-4735
Telex: +084 rtmtv ma 31383

Sistem TV Malaysia Berhad - TV3
7th-9th Floor, KUB Building, off Jln Syed Putra
58000 Kuala Lumpur, Malaysia
Telephone: +60 3 274-3111
Fax: +60 3 274-8896
Telex: +784 33014

TV Malaysia Sabah Nad Sarawak
P.O. Box 1016, 88614 Kota Kinabalu, Malaysia
Telephone: +60 88 52711
Telex: 784 80061

Other Recognized Operators

Syarikat Telkom Malaysia Bhd (STM)
Locked Bag 5005
15th Floor, Wisma Telekom
Jalan Pantai Baru
59990 Kuala Lumpur, Malaysia
Telephone: +60 3 2329494
Fax: +60 3 7557316
Telex: 30268 stmint

STM Cellular Communications Sdn. Bhd. (CELCOM)
3rd Floor, RHB 1
424, Jalan Tun Razak
50400 Kuala Lumpur, Malaysia
Telephone: +60 3 9849900
Fax: +60 3 9849300
Telex: 32320 Fleet

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Syarikat Telecom Malaysia Berhad (STM Telekom)
Ownership: 0.728871%
Earth stations:
Angkasapuri 1 (IOR major path) 63.0
Kuantan 1 (POR operational spare) 180.0
Kuantan 2 (POR primary) 174.0
Melaka 1 (IOR primary) 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Syarikat Telecom Malaysia Berhad (STM Telekom)
Ownership: NA
earth station: none

Range of Geostationary Satellites Visible

Location	Kuala Lumpur
Lat.°	3.1N
Long.°	101.7E
°Long. Differ. Visible	76°
Eastern Limit for GSO	178°E
Western Limit for GSO	26°E

■ MALDIVES

Official name: Republic of Maldives
Capital: Male
ITU country abbreviation: MLD
ITU Region: 3

International telephone dialing code: 960
International telex dialing code: NA

Demographic and Physical Information

Area: 300 km²
Population: 261,310
Major languages: Divehi, English
Time zones: GMT + 5h

Telecommunications Statistics

Number of telephones: 2,804
Submarine cable connections: none
Radio stations: 2 AM, 1 FM
Television standard: PAL B
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: 5,000
TV households: 5,000
Cable penetration: none
VCR penetration: 45%
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Department of Posts and Telecommunications
34 Marine Drive, Male' 2002, Maldives
Telephone: +960 323344

Officials

Riluvan Shareef, Director General, Posts and Telecommunications; Hussain Shareef, Director, Posts and Telecommunications

Broadcasting Services

Department of Information and Broadcasting
Ghaazee Bldg.
Male' 2005, Maldives
Telephone: +960 322252
Telex: 66085 hoadhum mf

Other Recognized Operators

DHIRAAGU
(Dhivehi Raajjey Ge Gulhun Private Ltd.)
Operations and Commercial Dept.
P.O. Box 2082
Male' 2082, Maldives
Telephone: 960 322802
Fax: 960 322 800

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Male
Lat.°	5N
Long.°	73E
°Long. Differ. Visible	76°
Eastern Limit for GSO	149°E
Western Limit for GSO	357°E (3°W)

■ MALI

Official name: Republic of Mali
Capital: Bamoko
ITU country abbreviation: MLI
ITU Region: 1

International telephone dialing code: 223
International telex dialing code: 985

Demographic and Physical Information

Area: 1.24 million km²
Population: 9.38 million
Major languages: French (official); Bambara
Time zones: GMT

Telecommunications Statistics

Number of telephones: 11,000
Submarine cable connections: none
Radio stations: 2 AM, 2 FM
Television standard: SECAM B
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: NA
TV households: NA
Cable penetration: none

VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Société des Telecommunications du Mali (Sotelma)
Route de Koulikoro
Boîte Postale 740
Bamako, Mali
Telephone: +223 22 52 80
Fax: +223 22 30 22

Officials
Sahibou Traore, Director-General, Sotelma

Broadcasting Services

Radiodiffussion Television du Mali - RTM
P.O. Box 171, Bamako, Mali
Telephone: +223 22 42 05 or 22 20 19
Fax: + 223 22 83 19
Telex: 0 985 2421

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telecommunications Internationales de Mali (TIM) (Telemali)
Ownership: 0.103321%
Earth stations:
Sullymangoubou 1 (AOR major path) 325.5
Sullymangoubou 2 (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Barnako
Lat.°	12.6N
Long.°	7.9W
°Long. Differ. Visible	76°
Eastern Limit for GSO	68°E
Western Limit for GSO	276°E (84°W)

MALTA

Official name: Republic of Malta
Capital: Valletta
ITU country abbreviation: MLT
ITU Region: 1
International telephone dialing code: 356
International telex dialing code: 0406

Demographic and Physical Information

Area: 320 km²
Population: 369,609
Major languages: English , Maltese (both official)
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 153,000
Submarine cable connections: 1
Radio stations: 8 AM, 4 FM
Television standard: PAL B
Electrical standard: 240 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: 2
Television sets: NA
TV households: 136,000
Cable penetration: none
VCR penetration: 64%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministry Transport and Communications
Lascaris
Valletta, Malta
Telephone: 240901
Telex: 0406 1108
Fax: 243306

Officials
Dr. Francis Zammit-Dimech, Minister for Transport and Communications

Broadcasting Services

Xandir Malta - MBA
P.O. Box 82, St. Luke's Road, Guadamangia
Valletta, Malta
Telephone: 225051
Fax: 244601
Telex: 0406 1443

Other Recognized Operators

Telemalta Corp.
Spencer Hill
Marsa, Malta
Telephone: 247770
Fax: 240761
Telex: 0406 1311 ptgm mw

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Telecommunication Union (ITU)

International Maritime Satellite Organization (Inmarsat); ownership 0.05%

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telemalta
Ownership: NA
Earth Stations: Maghtab 1 (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Valletta
Lat.°	35.9N
Long.°	14.5E
°Long. Differ. Visible	73°
Eastern Limit for GSO	88°E
Western Limit for GSO	302°E (52°W)

MALVINAS, ISLAS

see Falkland Islands

MALLORCA (SPAIN)

Range of Geostationary Satellites Visible

Location	Palma
Lat.°	39.6N
Long.°	2.6E
°Long. Differ. Visible	72°
Eastern Limit for GSO	75°E
Western Limit for GSO	291°E (69°W)

ISLE OF MAN (UNITED KINGDOM)

Range of Geostationary Satellites Visible

Location	Douglas
Lat.°	54.2N
Long.°	4.5W
°Long. Differ. Visible	66°
Eastern Limit for GSO	71°E
Western Limit for GSO	299°E (61°W)

MARSHALL ISLANDS

Official name: Republic of the Marshall Islands
Capital: Majuro
ITU country abbreviation: MHL
ITU Region: 3

International telephone dialing code: 692
International telex dialing code: NA

Demographic and Physical Information

Area: 181.3 km²
Population: 56,157
Major languages: English (official); Marshalese
Time zones: GMT + 12h

Telecommunications Statistics

Number of telephones: 756
Submarine cable connections: none
Radio stations: 1 AM, 2 FM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 2 Intelsat POR

Telecommunications Regulatory Organization

Ministry of Transport and Communications
Cabinet Bldg.
P.O. Box 2
Majuro 96960, Marshall Islands
Telephone: +692 9 3445
Fax: +692 9 4020
Telex: radiomar 36687 m

Officials

Mr. Kunio D. Lemari, Minister of Transportation and Communications

International Telecommunications Organization Membership

none

Range of Geostationary Satellites Visible

Location	Majuro
Lat.°	9N
Long.°	171W
°Long. Differ. Visible	76°
Eastern Limit for GSO	246°E
Western Limit for GSO	95°E

MARTINIQUE (FRANCE)

Status: overseas department of France
Capital: Fort-de-France
ITU abbreviation: none
ITU Region: 2

International telephone dialing code: 596
International telex dialing code: NA

Demographic and Physical Information

Area: 1,100 km²
Population: 394,787
Major languages: French, Creole patois
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 68,900
Submarine cable connections: none
Radio stations: 1 AM, 6 FM
Television standard: SECAM
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 10
Television sets: NA
TV households: 68,000
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 2 Intelsat AOR

Range of Geostationary Satellites Visible

Location	Fort-de-France
Lat.°	14.6N
Long.°	61W
°Long. Differ. Visible	76°
Eastern Limit for GSO	15°E
Western Limit for GSO	268°E (92°W)

MAURITANIA

Official name: Islamic Republic of Mauritania
Capital: Nouakchott
ITU country abbreviation: MTN
ITU Region: 1

International telephone dialing code: 222
International telex dialing code: 0947

Demographic and Physical Information

Area: 1.03 million km²
Population: 2.26 million
Major languages: Wolof ,Hasaniya Arabic (both official); Pular, Soninke
Time zones: GMT

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 2 AM
Television standard: SECAM B
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 10,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 2 Arabsat, six planned

Telecommunications Regulatory Organization

Office des Postes et des Telecommunications
Nouakchott, Mauritania
Telephone: +222 2 52340

Officials

Mohamed Ould Bouceif, Director-General; Cheikh Bekaye, Director of Telecommunications

Broadcasting Services

Television de Mauritanie
B.P. 200, Nouakchott, Mauritania
Telephone: +222 52164
Telex: + 935 515

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Arab Satellite Communications Organization (Arabsat); investment share 0.27%

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Islamic Republic of Mauritania
Ownership: 0.050000%
Earth stations:
Toujounine (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Nouakchott
Lat.°	18.1N
Long.°	16E
°Long. Differ. Visible	76°
Eastern Limit for GSO	60°E
Western Limit for GSO	268°E (92°W)

MAURITIUS

Official name: Mauritius
Capital: Port Louis
ITU country abbreviation: MAU
ITU Region: 1

International telephone dialing code: 230
International telex dialing code: 996

Demographic and Physical Information

Area: 1,860 km²
Population: 1.13 million
Major languages: English (official); Creole, French
Time zones: GMT +4h

Telecommunications Statistics

Number of telephones: <48,000
Submarine cable connections: none
Radio stations: 2 AM
Television standard: SECAM B
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 4
Television sets: NA
TV households: NA

Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Telecommunications Authority
Edith Cavell Street, First Floor, Ex-Telecommunications Headquarters, Port Louis, Mauritius
Telephone: +230 08 85 89
Telex: 4249 extern iw

Officials
Kristna, Swami Pyndiah, Director of Telecommunications

Broadcasting Services

Mauritius Broadcasting Corporation - Channel 1
1 Louis Pasteur Street, Forest Side, Mauritius
Telephone: + 230 675-5002
Fax: +230 675-7332
Telex: 4203

Other Recognized Operators

Mauritius Telecommunications Services Ltd.
Sir William Newtom Street
Port Louis, Mauritius
Telephone: +230 208-7000
Fax: +230 208-8881
Telex: 410

Overseas Telecommunications Service Co. Ltd (OTS)
1st Floor, P.C.L. Building
Port Louis, Mauritius
Telephone: + 230 208-3829
Fax: +230 08 10 70
Telex: +966 4209

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Overseas Telecommunications Services Company Limited of Mauritius (OTS Mauritius)
Ownership: 0.190338%
Earth stations:
Cassis 1 (IOR major path) 63.0
Cassis 2 (IOR primary) 60.0
Rodriques (IOR major path) 63.0

Range of Geostationary Satellites Visible

Location	Port Louis
Lat.°	20.2N
Long.°	57.5E
°Long. Differ. Visible	76°
Eastern Limit for GSO	133°E
Western Limit for GSO	346°E (14°W)

MAYOTTE

Status: territorial collectivity of France
Capital: Mamoutzou
ITU abbreviation: MYT
ITU Region: 1

International telephone dialing code: 269
International telex dialing code: NA

Demographic and Physical Information

Area: 375 km²
Population: 97,088
Major languages: Mahorian, French
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 450
Submarine cable connections: none
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: none

Range of Geostationary Satellites Visible

Location	Mamoutzou
Lat.°	12.2S
Long.°	44.3E
°Long. Differ. Visible	76°
Eastern Limit for GSO	120°E
Western Limit for GSO	328°E (32°W)

MENORCA (SPAIN)

Range of Geostationary Satellites Visible

Location	Mahon
Lat.°	40N
Long.°	4E
°Long. Differ. Visible	72°
Eastern Limit for GSO	76°E
Western Limit for GSO	292°E (68°W)

MEXICO

Official name: United Mexican States
Capital: Mexico City
ITU country abbreviation: MEX
ITU Region:

International telephone dialing code: 52
International telex dialing code: 383

Demographic and Physical Information

Area: 1.97 million km²
Population: 93.99 million
Major languages: Spanish
Time zones: GMT - 6h to GMT -8h

Telecommunications Statistics

Number of telephones: 6.41 million
Submarine cable connections: none
Radio stations: 679 AM, 22 shortwave
Television standard: NTSC M
Electrical standard: 127 vac, 60 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 238
Television sets: NA
TV households: 9.5 million
Cable penetration: 2%
VCR penetration: 28%
Satellite Earth stations: 4 Intelsat AOR, 1 Intelsat POR

Telecommunications Regulatory Organization

Direccion General de Politicas y Normas de Comunicaciones
Torre Central de Telecomunicaciones, Lazaro Cardenas 567, Anexo "B", Piso 2.03028 Mexico, D.F., Mexico
Telephone: +52 5 682-6170
Fax: +52 2 682-8698

Officials
Andres Caso Lombardo, Secretario de Comunicaciones y Transportes; Carlos Mier y Teran, Subsecretario de Comunicaciones y Transportes; Aljandro Lopez Toledo, Director-General, Policies and Standards; Carlos Lara-Sumano, Director-General, Telecomunicaciones

Telecomunicaciones de Mexico
Torre Central de Telecomunicaciones
Lázro Cárdenas 567, Piso 9
03028 - Mexico, D.F., Mexico
Telephone: +52 5 519-4049
Telex: +1760774 sunsme

Broadcasting Services

Televisa - TVA Avenida Chapultepec 28
06724 Mexico D.F., Mexico
Telephone: +52 5 709-3333
Fax: +52 5 709-4242
Telex: +383 1773154

Instituto Mexicano de Television - Imevision - Channel 13
Periferico Sur 4121
C.P. 14141 Mexico D.F., Mexico
Telephone: +52 5 568-1313
Fax: +52 5 203-1258
Telex: +383 177 7642 or 177 38782

Other Recognized Operators

Teléfonos de México S.A. (Telmex)
Parque Via, 198
Mexico 5, D.F., Mexico
Telephone: +52 2 591-0229
Fax: +52 5 546-8860
Telex: 1761161

Televisa, S.A.
Dr. Rio de la Loza 182
06720 Mexico D.F., Mexico
Telephone: +52 5 588-1549

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Mexico (Tetlecomex Mexico)
Ownership: 0.745446%
Earth stations:
Hermosilla 2 (POR primary) 174.0
Iztapalapa 5 (AOR spare) 307.0
Tulancingo 1 (AOR major path) 325.5
Tulancingo 2 (AOR primary) 335.5

Domestic Satellite Network

Operator: Telecomunicaciones de Mexico
Telephone: +52 519-63-43
Fax: +52 538-05-54
Telex: 1760758 sesnme

Satellites:
Morelos F1 246.5°E (113.5°W)
Morelos F2 243.5°E (116.5°W)

Range of Geostationary Satellites Visible

Location	Mexico City
Lat.°	17.1N
Long.°	99.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	337°E (23°W)
Western Limit for GSO	185°E (175°W)

MICRONESIA, FEDERATED STATES OF

Official name: Federated States of Micronesia
Capital: Kolonia
ITU country abbreviation: FSM
ITU Region: 3

International telephone dialing code: 691
International telex dialing code: 0764

Demographic and Physical Information

Area: 702 km²
Population: 122,950
Major languages: English
Time zones: GMT + 10h

Telecommunications Statistics

Number of telephones: 960
Submarine cable connections: none
Radio stations: 5 AM, 1 FM, 1 shortwave
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 6
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 4 Intelsat POR

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Kolonia
Lat.°	9N
Long.°	150E
°Long. Differ. Visible	76°
Eastern Limit for GSO	226 E
Western Limit for GSO	74°E

MIDWAY ISLANDS (UNITED STATES)

Range of Geostationary Satellites Visible

Location	Midway
Lat.°	28.2N
Long.°	177.4W
°Long. Differ. Visible	75°
Eastern Limit for GSO	252°E (107°W)
Western Limit for GSO	102°E

MOLDOVA

Official name: Republic of Moldova
Capital: Chisinau
ITU country abbreviation: MDA
ITU Region: 1

International telephone dialing code: 373
International telex dialing code: 0682

Demographic and Physical Information

Area: 33,700 km²
Population: 4.49 million
Major languages: Moldovan (official); Russian
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 577,000
Submarine cable connections: none
Radio stations: NA
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministry of Informatics, Information and Communications
134 Shtefan chel Mare Av.
277012 Kishinau, Moldova
Telephone: 0422-2288-324
Telex: 064 163227
Fax: 0422-241-553

Official
Ion L. Casian, Minister of Informatics, Information and Communications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Kishinev
Lat.°	47N
Long.°	28.8E
°Long. Differ. Visible	70°
Eastern Limit for GSO	99°E
Western Limit for GSO	319°E (41°W)

MONACO

Official name: Principality of Monaco
Capital: Monaco
ITU country abbreviation: MCO
ITU Region: 1

International telephone dialing code: 33
International telex dialing code: 042

Demographic and Physical Information

Area: 1.9 km²
Population: 31,515
Major languages: French (official), English
Time zones: GMT +1h

Telecommunications Statistics

Number of telephones: 38,200 (served by France)
Submarine cable connections: none
Radio stations: 3 AM, 4 FM
Television standard: VHF: SECAM L; UHF: SECAM G, PAL G
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: none
Private television networks: 1
Television stations: 5
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: 50%
Satellite Earth stations: none

Telecommunications Regulatory Organization

Direction Général des Postes et des Telecommunications
16, boulevard de Suisse
MC-98030 Monaco Cedex, Monaco
Telephone: 93 303371
Fax: 93 302474

Officials

César C. Solamito, Director-General, Posts and Telecommunications

Broadcasting Services

Tele Monte Carlo France - TMC
16 Blvd. Princess Charlotte
MC-98090, Monaco Cedex
Telephone: 93 151414
Fax: 93 151703
Telex: 042 469823

Tele Monte Carlo Italy - TMC
2 Blvd. Prince Hereditaire Albert
Monte Carlo 98090, Monaco
Telephone: 93 251783
Fax: 93 252531
Telex: 042 479606

Radio Monte Carlo
16, boulevard Princesse Charlotte
MC 98080 Monaco Cedex, Monaco
Telephone: 9 151617
Fax: 93-151703
Telex: 042-469926 radio carlo

Télé Monte-Carlo (SSE)
16, boulevard Princesse Charlotte
B.P. 279
MC 98090 Monaco Cedex, Monaco
Telephone: 93 151415
Telex: 042-469823

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Principality of Monaco (Via Intelfra Paris)
Ownership: 0.050000%
Earth stations: none

International Maritime Satellite Organization (Inmarsat)
Signatory: Government of the Principality of Monaco
Ownership: 0.097%
Earth station: none

Range of Geostationary Satellites Visible

Location	Monaco
Lat.°	43.8N
Long.°	7.4E
° Long. Differ. Visible	71°
Eastern Limit for GSO	79°E
Western Limit for GSO	296°E (64°W)

MONGOLIA

Official name: Mongolia
Capital: Ulaanbaatar
ITU country abbreviation: MNG
ITU Region: 1

International telephone dialing code: 976; 1+809
International telex dialing code: 719

Demographic and Physical Information

Area: 1.57 million km²
Population: 2.5 million
Major languages: Khalkha Mongol
Time zones: GMT +8h

Telecommunications Statistics

Number of telephones: 63,000
Submarine cable connections: none
Radio stations: 12 AM, 1 FM
Television standard: SECAM D
Electrical standard: NA
State-run television networks: 1
Private television networks: none
Television stations: 1 (18 repeaters)
Television sets: 120,000
TV households: 88,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: at least 1

Telecommunications Regulatory Organization

Ministry of Communications
Ulan Bator, Mongolia
Central Post Office 1104
Ulaan Baatar
Telephone: 20 820

Officials

H.E. Razdak Sandal Khan, Minister of Communications

Broadcasting Services

Mongolian TV Center
Ulan Bator, Mongolia

International Telecommunications Organization Membership

International Organization of Space Communications (Intersputnik)

Range of Geostationary Satellites Visible

Location	Ulaarbaatar
Lat.°	47.9N
Long.°	106.9E
° Long. Differ. Visible	70°
Eastern Limit for GSO	177°E
Western Limit for GSO	37°E

MONTENEGRO

see Yugoslavia

MONTSERRAT

Status: dependent territory of the United Kingdom
Capital: Plymouth
ITU abbreviation: MSR
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: NA

Demographic and Physical Information

Area: 100 km²
Population: 12,738
Major languages: English
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 3,000
Submarine cable connections: NA
Radio stations: 8 AM, 4 FM
Television standard: NTSC M
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Other Recognized Operators

Cable and Wireless (West Indies) Ltd.
Molyneaux Bldg.
Wall Street P.O. Box 219
Plymouth, Montserrat
Telephone: +1(809) 4912112
Telex: 5702 mni mgr mk

Range of Geostationary Satellites Visible

Location	Plymouth
Lat.°	16.7N
Long.°	62.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	14°E
Western Limit for GSO	222°E (138°W)

MOROCCO

Official name: Kingdom of Morocco
Capital: Rabat
ITU country abbreviation: MRC
ITU Region: 1

International telephone dialing code: 212
International telex dialing code: 933

Demographic and Physical Information

Area: 446,550 km²
Population: 29.17 million
Major languages: Arabic (official), Berber, French
Time zones: GMT

Telecommunications Statistics

Number of telephones: 280,000
Submarine cable connections: 5
Radio stations: 20 AM, 7 FM
Television standard: VHF: SECAM B; UHF: SECAM G
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 26 (26 repeaters)
Television sets: 3.2 million
TV households: 1.7 million
Cable penetration: none
VCR penetration: 36%
Satellite Earth stations: 2 Intelsat AOR, 1 Arabsat

Telecommunications Regulatory Organization

Ministere des Postes et des Telecommunications
Boulevard Moulay Al Hassan
Rabat, Morocco
Telephone: 7 702004
Fax: 7 705641
Telex: 0407 Miptel Rabat

Officials
Abdeslam Ahizourne, Minister of Posts and Telecommunications; Mohamed Mouhcine, Secretary General

Broadcasting Services

Moroccan Radio & Television System - R.T.M.
1 Rue El Brihi, Rabat, Morocco
Telephone: 70 47 49 or 70 54 34
Fax: 7 7-04292
Telex: 0407 31010

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat); investment share 0.61%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Office National des Postes et Telecommunications
Ownership: 0.179084%
Earth stations:
Sehouls (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Rabat
Lat.°	34N
Long.°	6.8W
°Long. Differ. Visible	74°
Eastern Limit for GSO	67°E
Western Limit for GSO	280°E (80°W)

MOZAMBIQUE

Official name: Republic of Mozambique
Capital: Maputo
ITU country abbreviation: MOZ
ITU Region: 1

International telephone dialing code: 258
International telex dialing code: 946

Demographic and Physical Information

Area: 801,590 km²
Population: 18.12 million
Major languages: Portuguese (official)
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 29 AM, 4 FM
Television standard: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 2 Intelsat AOR, 3 Intelsat IOR for domestic uses

Telecommunications Regulatory Organization

Ministerio dos Transportes e Comunicacoes
Caixa postal 1937
Maputo, Mozambique
Telephone: +258 1 490131

Officials
Armando Emilo Guebuza, Minister of Transport and Communications; Isaias Muhate, Deputy Minister of Transport Communications

Telecomunicacoes de Mozambique
P.O. Box 25
Rua da se No. 2
Maputo, Mozambique
Telephone: +258 1 431921
Telex: 6509 dgtdm mo

Officials
Sr. Rui Fernandes, Director General da Empresa Telecomunicacoes de Mozambique

Broadcasting Services

Televisao Experimental de Mozambique
Ave. Julius Nyerere No. 942
Caixa Postal 2675
Maputo, Mozambique
Telephone: +258 491189 or 491395
Fax: +258 490961 or 491345
Telex: +946 6-346, 6-821, or 6-822

Other Recognized Operators

Teledata de Mozambique, LDA
P.O. Box 4170
Maputo, Mozambique

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Nacional de Telecomunicacoes de Mozambique (Telecom Mozambique)
Ownership: 0.062527%
Earth stations:
Boane (AOR primary) 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Empresa Nacional de Telecomunicacoes de Mozambique
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Maputo
Lat.°	26S
Long.°	32.5E
°Long. Differ. Visible	75°
Eastern Limit for GSO	107°E
Western Limit for GSO	318°E (42°W)

■ MYANMAR (FORMERLY BURMA)

Official name: Union of Myanmar
Capital: Rangoon (Yangon)
ITU country abbreviation: BRM
ITU Region: 3
International telephone dialing code: 95
International telex dialing code: 713

Demographic and Physical Information

Area: 678,500 km²
Population: 45.2 million
Major languages: Burmese
Time zones: GMT + 6h30m

Telecommunications Statistics

Number of telephones: 53,000
Submarine cable connections: none
Radio stations: 2 AM, 1 FM
Television standard: NTSC M
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: 70,000
TV households: 68,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of, Communications, Posts and Telegraphs
Myanmar Posts and Telecommunications Department, No. 125 Pansodan Street, Ground Floor, Yangon, Myanmar
Telephone: +95 1 86364
Fax +95 1 86365

Officials

Tin Tun, Minister of Communications, Posts and Telegraphs; U Shwe Than, Deputy Minister of Transport and Communications

Broadcasting Services

Burma Broadcasting Service
GPO Box 1432
Rangoon, Myanmar
Telephone: +95 1 31355
Telex: +713 21360

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Gentel Rangoon
Ownership: NA
Earth Stations: Rangoon (Ior primary) 60.0

Range of Geostationary Satellites Visible

Location	Rangoon
Lat.°	16.7N
Long.°	96.3E
°Long. Differ. Visible	76°
Eastern Limit for GSO	172°E
Western Limit for GSO	20°E

■ NAMIBIA

Official name: Republic of Namibia
Capital: Windhoek
ITU country abbreviation: NMB
ITU Region: 1

International telephone dialing code: 264
International telex dialing code: NA

Demographic and Physical Information

Area: 825,418 km²
Population: 1.65 million
Major languages: English (official); Afrikaans, German
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 62,800
Submarine cable connections: NA
Radio stations: 4 AM, 40 FM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 3
Television sets: NA
TV households: 50,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

The Postmaster General
P.O. Box 287, Windhoek 9000, Namibia
Telephone: +264 61 2019111
Fax: 264 61 226500

Officials

A.W.G. Ruck, Postmaster General

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Windhoek
Lat.°	22.6S
Long.°	17.1E
°Long. Differ. Visible	73°
Eastern Limit for GSO	92°E
Western Limit for GSO	304°E (56°W)

■ NAURU

Official name: Republic of Nauru
Capital: none as such; government offices in Yaren district
ITU country abbreviation: NRU
ITU Region: 3

International telephone dialing code: 674
International telex dialing code: NA

Demographic and Physical Information

Area: 21 km²
Population: 10,149
Major languages: Nauruan (official); English
Time zones: GMT + 12h

Telecommunications Statistics

Number of telephones: 1,600
Submarine cable connections: NA
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none

Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Director of Telecommunications
Naura
Telephone: +674 3324
Telex: nru imc zv33086

Officials

Edward W.R.H. DeYoung, Director of Telecommunications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Nauru
Lat.°	1S
Long.°	166E
°Long. Differ. Visible	77°
Eastern Limit for GSO	243°E
Western Limit for GSO	89°E

NEPAL

Official name: Kingdom of Nepal
Capital: Kathmandu
ITU country abbreviation: NPL
ITU Region: 3

International telephone dialing code: 977
International telex dialing code: 947

Demographic and Physical Information

Area: 140,800 km²
Population: 21.6 million
Major languages: Nepali (official)
Time zones: GMT + 5h30m

Telecommunications Statistics

Number of telephones: 50,000
Submarine cable connections: none
Radio stations: 88 AM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: 250,000
TV households: 50,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Information and Communication
Singha Durbar, Kathmandu, Nepal
Telephone: +977 1 220150
Fax: 977 1 227310

Officials

Bijaya Kumar Gachhedar, Minister of Communication; Jit Bahadur Manandhar, Secretary, Ministry of Communication

Broadcasting Services

Nepal Television - NTV - Channel 5
P.O. Box 3826, Singha Durbar
Panchayat Plaza
Kathmandu, Nepal
Telephone: +977 2 228447
Fax: +977 1 228312
Telex: +947 2548

Other Recognized Operators

Nepal Telecommunications Corporation
Central Office
Singhdurbar, Putli Bagaicha
Kathmandu, Nepal
Telephone: +977 1215444
Fax: +977 1 226260
Telex: 2201 Telcom np

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Nepal Telecommunications Corporation
Ownership: 0.090267%
Earth stations:
Sagamartha (IOR primary) 60.0

Range of Geostationary Satellites Visible

Location	Kathmandu
Lat.°	27.7N
Long.°	85.3E
°Long. Differ. Visible	75°
Eastern Limit for GSO	160°E
Western Limit for GSO	10°E

NETHERLANDS

Official name: Kingdom of the Netherlands
Capital: Amsterdam (The Hague is the seat of government)
ITU country abbreviation: HOL
ITU Region: 1

International telephone dialing code: 31
International telex dialing code: 044

Demographic and Physical Information

Area: 37,330 km²
Population: 15.45 million
Major languages: Dutch
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 9.42 million
Submarine cable connections: 5
Radio stations: 3 AM (3 relays), 12 FM (39 repeaters)
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 8 (7 repeaters)
Television sets: NA
TV households: 5.5 million
Cable penetration: 85%
VCR penetration: 50%
Satellite Earth stations: 2 Intelsat AOR, 1 Intelsat IOR, 1 Eutelsat

Telecommunications Regulatory Organization

Ministry of Transport, Public Works and Water Management
Telecommunications and Post Department,
P.O. Box 20901
2500 EX The Hague, Netherlands
Telephone: 70 3516171
Fax: 70 3516505
Telex: 044 32562

Officials

Albert de Ruiter, Head, Telecommunications and Posts

Telecommunications Operator

PTT Telcom Netherlands
International Telecommunications
P.O. Box 30150
2500 GD The Hague, Netherlands
Telephone: 70 3434343
Fax: 70 3432040
Telex: 044 31255 itel nl

Broadcasting Services

Netherlanse Omrpoep Bestel - NOB
P.O. Box 444
1200 JG Hilversum, Netherlands
Telephone: 35 779222 or 779111
Fax: 35 774325
Telex: +844 43211

FilmNer Plus
Postbus 1374
NL-3430 BH Nieuwegein, Netherlands
Telephone: 3402-50120
Fax: 3402-50005

Kindernet
Prinsengracht 532
NL-1017 KJ Amsterdam, Netherlands
Telephone: 20-625-2859
Fax: 20-638-1229
Telex: 044 11258 kinet nl

MTV Europe
Raad huisstraat 52 III
NL-1016 DG Amsterdam, Netherlands
Telephone: 20-620-3393
Fax: 20-620-9310

RVU (Educational Broadcasting Organization)
P.O. Box 1950
1200 BZ Hilversum, Netherlands
Telephone: 35 40551
Fax: 35 40555
Telex: +844 43311

Stichting Raido Nederland Wereldomroep
P.O. Box 222
1200 JG Hilversum, Netherlands
Telephone: 35 216151
Telex: 43336 womr nl

RTL 4
P.O. Box 15000
1200 TV Hilversum, Netherlands
Telephone: 35 71 87 18
Fax: 35 23 68 92

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 5.19945%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: PTT Nederland NV
Ownership: 1.219379%
Earth stations:
Burum 1 (AOR primary) 335.5
Burum 2 (AOR major path) 325.5
Burum 3 (IOR primary) 60.0
Burum 4 (IOR major path) 63.0

International Maritime Satellite Organization (Inmarsat)
Signatory: PTT Nederland NV
Ownership: 2.51223%
Earth station:
Burum (AORE)
Burum (IOR)

Range of Geostationary Satellites Visible

Location	Amsterdam
Lat.°	52.4N
Long.°	4.9E
°Long. Differ. Visible	68°
Eastern Limit for GSO	72°E
Western Limit for GSO	297°E (63°W)

NETHERLANDS ANTILLES (NETHERLANDS)

see individual entries for Bonaire, Curaçao, Saba, St. Eustatius, St. Maarten

NEVIS

See St. Kitts and Nevis

Range of Geostationary Satellites Visible

Location	Nevis
Lat.°	17N
Long.°	62.5E
°Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	222°E (138°W)

NEW CALEDONIA (FRANCE)

Official name: Territory of New Caledonia and Dependencies
Status: overseas territory of France
Capital: Nouméa
ITU abbreviation: NCL
ITU Region: 3

International telephone dialing code: 687
International telex dialing code: NA

Demographic and Physical Information

Area: 19,060 km²
Population: 184,552
Major languages: French
Time zones: GMT + 12h

Telecommunications Statistics

Number of telephones: 32,578
Submarine cable connections: none
Radio stations: 5 AM, 3 FM
Television standard: SECAM
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 7
Television sets: NA
TV households: 41,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Direction de l'Office des Postes
et des Télécommunications
Noumea
Nouvelle-Calédonie
BP N. A1
Noumea
Nouvelle-Calédonie
Telephone: +687 261642
Fax: +687 285983
Telex: 0706 3800

France Cables et Radio (FCR)
Télécommunications extérieures
de la Nouvelle Calédonie
BP No. A1
Noumea
Nouvelle-Calédonie
Telephone: +687 261642
Fax: +687 285983

Range of Geostationary Satellites Visible

Location	Nouméa
Lat.°	21.3S
Long.°	166.5E
°Long. Differ. Visible	75°
Eastern Limit for GSO	242°E
Western Limit for GSO	92°E

NEW ZEALAND

Official name: New Zealand
Capital: Wellington
ITU country abbreviation: NZL
ITU Region: 3

International telephone dialing code: 64
International telex dialing code: 791

Demographic and Physical Information

Area: 268,680
Population: 3.35 million
Major languages: English (official); Maori
Time zones: GMT + 12h

Telecommunications Statistics

Number of telephones: 2.11 million
Submarine cable connections: 2
Radio stations: 64 AM, 2 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: 2
Television stations: 14
Television sets: 1.25 million
TV households: 1.0 million
Cable penetration: none
VCR penetration: 64%
Satellite Earth stations: 4 Intelsat POR

Telecommunications Regulatory Organization

Ministry of Commerce
Communications Division
P.O. Box 1473
Wellington, New Zealand
Telephone: +64 4 720030
Fax: (2/3)+64 4 4990797

Officials

H.M. Donaldson, General Manager, Communications

Broadcasting Services

Television New Zealand - TVNZ
(TVNZ has two channels: Television One and Channel Two)
P.O. Box 3819
Auckland, New Zealand
Telephone: +64 977-9730
Fax: +64 975-0979
Telex: +791 63047

TVNZ - Television One (News and Information)
P.O. Box 30945
Lower Hutt, Wellington, New Zealand
Telephone: +64 466-6969
Fax: +64 465-8959
Telex: +791 3867

TVNZ - Network Two (Entertainment)
Network Center
100 Victoria Street
P.O. Box 3819, Auckland, New Zealand
Telephone: +64 979-2700
Fax: +64 975-0828
Telex: +791 60056

TV3 - New Zealand
Private Bag, Auckland, New Zealand
Telephone: +64 977-9730
Fax: +64 9 366-7029

Canterbury Television - CTV
P.O. Box 3741, Christchurch, New Zealand
Telephone: +64 3 365-5505
Fax: +64 3 365-5773

Sky Network Television LTD
P.O. Box 9059
Newmarket, Auckland, New Zealand
Telephone: +64 9 579-9999
Fax: +64 9 579-0910

Other Recognized Operators

Telecom Networks and International Ltd. (TNI)
Telcom Corp. of New Zealand Ltd.
P.O. Box 1092
Wellington, New Zealand
Telephone: +64 473-8444
Fax: +2/3) +64 473-1399
Telex: Telint nz 31688

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telecom Corporation of New Zealand
Ownership: 0.661044%
Earth stations:
Rangiora 1 (POR spare) 180.0
Warworth 1 (POR spare) 180.0
Warworth 2 (POR primary) 174.0
Wellington 1 (POR spare) 180.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Telecom Corporation of New Zealand
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Wellington
Lat.°	41.3S
Long.°	174.8E
° Long. Differ. Visible	72°
Eastern Limit for GSO	247°E
Western Limit for GSO	103°E

■ NICARAGUA

Official name: Republic of Nicaragua
Capital: Managua
ITU country abbreviation: NCG
ITU Region: 2

International telephone dialing code: 505
International telex dialing code: 302

Demographic and Physical Information

Area: 129,494 km²
Population: 4.21 million
Major languages: Spanish
Time zones: GMT - 6h

Telecommunications Statistics

Number of telephones: 60,000
Submarine cable connections: none
Radio stations: 45 AM, 3 shortwave
Television standard: NTSC M
Electrical standard: 120 vac, 60 Hz
State-run television networks: 1
Private television networks: 2
Television stations: 7
Television sets: NA
TV households: 200,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Intersputnik

Telecommunications Regulatory Organization

Instituto Nicarguense de Telecomunicaciones y Correo (TELCOR)
Eliso Duarte-Villa Panama
Apartado Postal 232
Managua, Nicaragua
Telephone: +505 2 71134
Fax: +505 2 678420

Officials

Pablo Vijil Ycaza, Director-General, TELCOR; Ananstasio Gonzales Osorio, Deputy Minister

Broadcasting Services

TV Nicaragua - Canal 6
Apartado 1505
Managua, Nicaragua
Telephone: + 505 2 660118 or 660119
Fax: +505 2 666522
Telex: +302 1226

Televicentro de Nicaragua - Canal 2
Apartado Postal 688
Managua, Nicaragua
Telephone: +505 2 663764
Fax: +505 2 663688

Other Recognized Operators

Empresa Nicarguense de Telecommunicacions (Entel)
Managua, Nicaragua
Telephone: +505 2 51812
Telex: 1458

Nicatelsat
Compañía Nicarguense de
Telecommunications por satélite
Apartado de correos 4567
Managua, Nicaragua
Telephone: + 505 2 25737
Telex: 2448

International Telecommunications Organization Membership

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Instituto Nicaraguense de Telecomunicaciones y Correos (Telcor)
Ownership: 0.050000%
Earth stations:
Managua (AOR major path) 325.5

Range of Geostationary Satellites Visible

Location	Managua
Lat.°	12.3S
Long.°	86.5E
°Long. Differ. Visible	76°
Eastern Limit for GSO	349°E (11°W)
Western Limit for GSO	197°E (163°W)

NIGER

Official name: Republic of Niger
Capital: Niamey
ITU country abbreviation: NGR
ITU Region: 1

International telephone dialing code: 227
International telex dialing code: 982

Demographic and Physical Information

Area: 1.27 million km²
Population: 9.28 million
Major languages: French (official); Hausa, Djerma
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 14,260
Submarine cable connections: none
Radio stations: 15 AM, 5 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 18
Television sets: 50,000
TV households: 35,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Office des Postes et des Telecommunications (OPT)
Niamey, Niger
Telephone: +227 722000

Officials

Abba Mamadou, Director-General, OPT
Société des Télécommunications Internationales du Niger (STIN)
Boîte postale 208
Niamey, Niger
Telephone: +227 722857
Fax: +227 33569
Telex: Stin 5208 ni

Broadcasting Services

Television Nationale
B.P. 309, Niamey, Niger
Telephone: +227 72 31 53 or 72 31 54
Fax: +227 72 35 48
Telex: +982 5229

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Republic of Niger
Ownership: 0.050000%
Earth stations:
Goudel (IOR primary) 60.0
Karma (AOR major path) 325.5

Range of Geostationary Satellites Visible

Location	Niamey
Lat.°	13.4N
Long.°	2.1E
°Long. Differ. Visible	76°
Eastern Limit for GSO	78°E
Western Limit for GSO	286°E (74°W)

NIGERIA

Official name: Federal Republic of Nigeria
Capital: Abuja (some offices remain in old capital of Lagos)
ITU country abbreviation: NIG
ITU Region: 1

International telephone dialing code: 234
International telex dialing code: 961

Demographic and Physical Information

Area: 923,770 km²
Population: 101.23 million
Major languages: English (official); Hausa, Yoruba, Ibo, Fulani
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: 1
Radio stations: 35 AM, 17 FM
Television standard: VHF: PAL B; UHF: PAL I
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 28
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: 12%
Satellite Earth stations: 2 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Communications
Private Mail Bag 12755, GPO Marina, Lagos, Nigeria
Telephone: +234 655055
Fax: +234 1 610069

Officials

Olawale A. Ige, Minister of Communications; E.B. Zojeba, Chief, International Relations

Broadcasting Services

Nigerian Television Authority - NTA
Television House
Ahmadu Bell Way
Victoria Island
P.M.B. 12036, Lagos, Nigeria
Telephone: +234 1 615154
Fax: + 234 1 615933 & 619485
Telex: +961 22531

NTVNG
Sokoto, Gusau Road
Lagos, Nigeria
Telex: +961 73131

Other Recognized Operators

Nigerian Telecommunications Ltd. (Nitel)
Necom House 15
Marina P.O. Box 173
Private Mail Bag No. 12742
Lagos, Nigeria
Telephone: +234 1 659666
Fax: +234 1 610069
Telex: 11001 netad ng

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Nigerian External Communications Ltd.
Ownership: 0.894590%
Earth stations:
Kujama (AOR major path 1) 325.5
Lanlate 1 (IOR primary) 60.0
Lanlate 2 (AOR primary) 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Nigerian External Communications Ltd.
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Lagos
Lat.°	6.4N
Long.°	3.4E
°Long. Differ. Visible	76°
Eastern Limit for GSO	80°E
Western Limit for GSO	287°E (73°W)

NIGHTINGALE ISLAND

see St. Helena

NIUE

Status: self-governing with free association with New Zealand
Capital: Alofi
ITU abbreviation: NIU
ITU Region: 3

International telephone dialing code: 683
International telex dialing code: NA

Demographic and Physical Information

Area: 260 km^2
Population: 1,837
Major languages: Polynesian, English
Time zones: GMT -10 h

Telecommunications Statistics

Number of telephones: 383
Submarine cable connections: none
Radio stations: 1 AM. 1 FM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Director of Posts and Telecommunications
Alofi, Niue
Telephone: +184
Telex:0776 nf67013 niucom

Range of Geostationary Satellites Visible

Location	Alofi
Lat.°	19.0S
Long.°	169.9W
°Long. Differ. Visible	76°
Eastern Limit for GSO	266°E (94°W)
Western Limit for GSO	114°E

NORFOLK ISLAND (AUSTRALIA)

Status: territory of Australia
Capital: Kingston

International telephone dialing code: NA
International telex dialing code: NA

Demographic and Physical Information

Area: 34.6 km^2
Population: 2,756
Major languages: English

Telecommunications Statistics

Number of telephones: 987
Submarine cable connections: NA
Radio stations: 1 AM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Range of Geostationary Satellites Visible

Location	Norfolk
Lat.°	29.0S
Long.°	168.0E
°Long. Differ. Visible	75°
Eastern Limit for GSO	242°E
Western Limit for GSO	93°E

NORTHERN IRELAND

see United Kingdom

Range of Geostationary Satellites Visible

Location	Belfast
Lat.°	54.6N
Long.°	5.9W
°Long. Differ. Visible	66°
Eastern Limit for GSO	72°E
Western Limit for GSO	300°E (60°W)

NORTH KOREA

see Korea, North

NORTHERN MARIANA ISLANDS

Official name: Commonwealth of the Northern Mariana Islands
Status: commonwealth in political union with the United States
Capital: Saipan
ITU abbreviation: none
ITU Region: 3

International telephone dialing code: NA
International telex dialing code: NA

Demographic and Physical Information

Area: 477 km^2 (total of 16 islands)
Population: 51,033
Major languages: English, Chamorro, Carolinian
Time zones: GMT - 10 h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 2 AM, 1 FM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 1; 2 cable stations
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 2 Intelsat POR

Range of Geostationary Satellites Visible

Location	Saipan
Lat.°	15.2N
Long.°	145.8E
°Long. Differ. Visible	76°
Eastern Limit for GSO	222°W (138°W)
Western Limit for GSO	70°E

NORWAY

Official name: Kingdom of Norway
Capital: Oslo
ITU country abbreviation: NOR
ITU Region: 1

International telephone dialing code: 47
International telex dialing code:056

Demographic and Physical Information

Area: 324,220 km^2
Population: 4.33 million
Major languages: Norwegian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 3.1 million
Submarine cable connections: 4
Radio stations: 46 AM, 493 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 54 (2,100 repeaters)
Television sets: 1.5 million
TV households: 2 million
Cable penetration: 34%
VCR penetration: 52%
Satellite Earth stations: Intelsat AOR, Eutelsat, Marisat

Telecommunications Regulatory Organization

Norwegian Telecommunications Regulatory Authority (NTRA)
P.O. Box 2592 Solli
N - 0203 Oslo 1, Norway
Telephone: 22-926600
Fax: 22-560-850
Telex: 056 79544 ntra n

Officials
Roald Ekholdt, Director General, NTRA

Telecommunications Operator

Norwegian Telecom
Postboks 6701
St. Olavs plass
N-0130 Oslo 1, Norway
Telephone: 22-488990
Fax: 22-778720

Officials
Tormod Hermanson, Managing Director, Norwegian Telcom

Broadcasting Services

Norsk Rikskringkasting - NRK
Bjoernstjerne Bjoernsons Plass 1
N-0340 Oslo 3, Norway
Telephone: 22 459050
Fax: 22-459-833
Telex: 056 76820

TV 2 Norway
P.O. Box 2
5002 Bergen, Norway
Telephone: 5 908970
Fax: 5 908090

TVNORGE A/S
Sagvein 17
N-0458 Oslo, Norway
Telephone: 22 350350
Fax: 22 351000

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.62245%
International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Norwegian Telecom (Televerket)
Ownership: 0.699644%
Earth stations:
Nittedal 2 (AOR spare) 359.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Norwegian Telecom (Televerket)
Ownership: 10.65912%
Earth station:
Eik (AORE)
Eik (IOR)

Domestic Satellite Network

Operator: Norwegian Telecom
Telephone: 248-8990
Fax: 248-8720
Telex: 71203 gentln

Satellites:
Thor 359°E (0.8°W) DBS

Range of Geostationary Satellites Visible

Location	Oslo
Lat.°	59.9N
Long.°	10.7E
°Long. Differ. Visible	62°
Eastern Limit for GSO	73°E
Western Limit for GSO	309°E (51°W)

Location	Vadso
Lat.°	70.1N
Long.°	29.8E
°Long. Differ. Visible	47°
Eastern Limit for GSO	77°E
Western Limit for GSO	343°E (17°W)

■ OMAN

Official name: Sultanate of Oman
Capital: Muscat
ITU country abbreviation: OMA
ITU Region: 1

International telephone dialing code: 968
International telex dialing code: 0498

Demographic and Physical Information

Area: 212,460 km²
Population: 2.13 million
Major languages: Arabic (official), English,
Time zones: GMT + 4h

Telecommunications Statistics

Number of telephones: 50,000
Submarine cable connections: none
Radio stations: 2 AM, 3 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 7
Television sets: NA
TV households: 225,000
Cable penetration: none
VCR penetration: 25%
Satellite Earth stations: 2 Intelsat IOR, 1 Arabsat

Telecommunications Regulatory Organization

Ministry of Posts, Telegraphs, and Telephones
P.O. Box 3338, Ruwi
Muscat, Oman
Telephone: 697870
Fax: 696817
Telex: 0498 5625

Officials
Ahmed bin Suwaidan Al-Balushi, Minister of Posts, Telegraphs, and Telephones, Abdulah bin Said bin Abdullah, Undersecretary

Telecommunications Operator

General Telcommunications Organization (GTO)
P.O. Box 3789, Ruwi
Muscat, Oman
Telephone: 697851
Telex: 0498 5400 gentel on

Official
Noor bin Mohamed bin Abdur Rahman, Executive President

Broadcasting Services

Sultanate of Oman Television
Ministry of Information
P.O. Box 1071 CPO
Muscat, Oman
Telephone: 603222
Fax: 605032
Telex: +926 5454

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat): investment share 1.23%

International Telecommunication Union (ITU)
International Telecommunications Satellite Organization (Intelsat)
Signatory: Sultanate of Oman
Ownership: 0.208125%
Earth stations:
Al Amerat 1 (IOR primary) 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Sultanate of Oman
Ownership: 0.05%
Earth station: none

Range of Geostationary Satellites Visible

Location	Muscat
Lat.°	23.6N
Long.°	58.6E
°Long. Differ. Visible	75°
Eastern Limit for GSO	134°E
Western Limit for GSO	344°E (16°W)

PACIFIC ISLANDS, TRUST TERRITORY OF THE

see Palau

PAGO PAGO

see American Samoa

PAKISTAN

Official name: Islamic Republic of Pakistan
Capital: Islamabad
ITU country abbreviation: PAK
ITU Region: 3

International telephone dialing code: 92
International telex dialing code: 952

Demographic and Physical Information
Area: 803,940 km²
Population: 131.6 million
Major languages: Urdu and English (both official), Punjabi
Time zones: GMT + 5h

Telecommunications Statistics
Number of telephones: 7 per 1,000 persons
Submarine cable connections: none
Radio stations: 19 AM, 8 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks:
Private television networks: 1
Television stations: 29
Television sets: 7 million
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 2 Intelsat IOR, 1 Intelsat AOR

Telecommunications Regulatory Organization
Pakistan Telecommunication Corporation
Headquarters, Rizwan Centre 85 West
Islamabad, Pakistan
Telephone: +92 51 843991
Fax: +92 51 851307

Officials
Mian Mohammad Javed, Chairman, Pakistan Telecommunications

Broadcasting Services
Pakistan Television Corp.
P.O. Box 1221
Constitution Ave.
Islamabad, Pakistan
Telephone: +92 51 828651/5
Fax: +92 51 823406
Telex: 952 5833

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Islamic Republic of Pakistan
Ownership: 0.726073%
Earth stations:
Deh Mandro 1 (IOR primary) 60.0
Deh Mandro 2 (AOR spare) 359.0
Mallach (IOR major path) 63.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Government of the Islamic Republic of Pakistan
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Islamabad
Lat.°	33.7N
Long.°	73.2E
°Long. Differ. Visible	74°
Eastern Limit for GSO	147°E
Western Limit for GSO	359°E (1°W)

PALAU

(Note: also called Trust Territory of the Pacific Islands, and Belau)

Official name: Republic of Palau (formerly Trust Territory of the Pacific Islands)
Capital: Koror (new capital under construction at Babelthuap)
ITU country abbreviation: none
ITU Region: 3

International telephone dialing code: 680
International telex dialing code: NA

Demographic and Physical Information
Area: 458 km²
Population: 16,661
Major languages: English (official); Palauan
Time zones: GMT GMT + 9 h

Telecommunications Statistics
Number of telephones: NA
Submarine cable connections: NA
Radio stations: 1 AM, 1 FM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 2
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat POR

International Telecommunications Organization Membership

none (under United States Trusteeship, and has voted to enter a Compact of Free Association with the U.S., but this has not entered into force)

Range of Geostationary Satellites Visible

Location	Palau
Lat.°	7.5N
Long.°	130.5E
°Long. Differ. Visible	75°
Eastern Limit for GSO	205°E
Western Limit for GSO	55°E

PANAMA

Official name: Republic of Panama
Capital: Panama City
ITU country abbreviation: PNR
ITU Region: 2

International telephone dialing code: 507
International telex dialing code: 328, 348, 368

Demographic and Physical Information

Area: 78,200 km²
Population: 2.68 million
Major languages: Spanish, English
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 220,000
Submarine cable connections: 1
Radio stations: 91 AM
Television standard: NTSC M
Electrical standard: 110, 115, and 120 vac, 60 Hz
State-run television networks: none
Private television networks: 5
Television stations: 23
Television sets: NA
TV households: 500,000
Cable penetration: 3%
VCR penetration: 28%
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Instituto Nacional de Telecomunicaciones (Intel)
Gerencia Ejecutiva Internacional
Apartado Postal 659, Panama 9A, Panama
Telephone: +507 235131
Fax: +507 230934

Officials

Francisco Denis Duran, Gerente General, Justo Perez Cuca, Genrente Ejecutivo de Operaciones; Alex A. Arroyo, Gerente Ejecutivo de Desarrollo, Intel; Cristobal Samudio, Gerente Ejecutivo Administrativo, Intel; Edilbrando Denis Cerrud, Gerente Ejecutivo Internacional, Intel; Horacio A. Robles, Subgerente General, Intel

Broadcasting Services

Corporation Panamena de Radiodifusion - Canal 4
Ave. Nacional y calle 28
Edificio Chesterfield, Panama
Telephone: +507 25 01 60
Fax: +507 25 07 05
Telex: +328/348/369 2412

Medios Panamenos - Telemetro - Canal 13
Apartado 8/116
El Durado, Panama
Telephone: +507 692 122

Televisora Nacional - S.A. Canal 2 - TVN
Apartado Postal 6-3092
El Durado, Panama
Telephone: +507 36 22 22
Fax: +507 36 41 59
Telex: +328/348/369 2625

Canal Once (11) - TV
Sistema de Television Educativa
Calle Jose de Fabrega
Estafeta Universitaria
Universidad de Panama
Telephone: +507 69 7 55/3848/3641/3516

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Instituto Nacional de Telecomunicaciones (Intel)
Ownership: 0.050000%
Earth stations:
Utibe 1 (AOR major path) 342.0
Utibe 2 (AOR primary) 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Instituto Nacional de Telecomunicaciones (Intel)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Panama City
Lat.°	7.0N
Long.°	79.4W
°Long. Differ. Visible	76°
Eastern Limit for GSO	357°E (3°W)
Western Limit for GSO	204°E (156°W)

■ PAPUA NEW GUINEA

Official name: Independent State of Papua New Guinea
Capital: Port Moresby
ITU country abbreviation: PNG
ITU Region:

International telephone dialing code: 675
International telex dialing code: 794

Demographic and Physical Information

Area: 461,690 km²
Population: 4.3 million
Major languages: pidgin English, 715 other languages
Time zones: GMT + 10h

Telecommunications Statistics

Number of telephones: <70,000
Submarine cable connections: 2
Radio stations: 31 AM, 2 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 240 vac, 50 Hz
State-run television networks: none
Private television networks: 1
Television stations: 2
Television sets: 200,000
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Posts and Telcommunications Corporation
P.O. Box 1349
Boriko, Papua New Guinea
Telephone: +675 274111
Fax: +675 213163

Officials

Dale P. Kamara, Director, Corporate Relations; R.M. Elias, Managing Director; Alan G. Brooks, General Manager, Telecommunications: Clark Kuliniasi, Executive Manager, International

Broadcasting Services

EMTV
P.O. Box 443
Boroko, Port Moresby, Papua New Guinea
Telephone: +675 9 25 73 22
Fax: +675 9 25 44 50

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Posts and Telecommunication Corporation of New Guinea
Ownership: 0.050000%
Earth stations:
Port Moresby (POR primary) 174.0

Range of Geostationary Satellites Visible

Location	Port Moresby
Lat.°	9.4S
Long.°	147.1E
°Long. Differ. Visible	76°
Eastern Limit for GSO	223°E
Western Limit for GSO	71°E

■ PARAGUAY

Official name: Republic of Paraguay
Capital: Asunción
ITU country abbreviation: PRG
ITU Region: 2

International telephone dialing code: 595
International telex dialing code: 399

Demographic and Physical Information

Area: 406,750 km²
Population: 5.36 million
Major languages: Spanish (official); Guarani
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 78,300
Submarine cable connections: none
Radio stations: 40 AM, 7 shortwave

Television standard: PAL N
Electrical standard: 220 vac, 50 Hz
State-run television networks: none
Private television networks: 2
Television stations: 5
Television sets: NA
TV households: 266,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Administracion Nacional de Telecomunicaciones (Antelco)
Casilla Correo 2042
Asuncion, Paraguay
Telephone: +595 21 494216

Officials
Guillermo Godoy Galeano, Council President, Antelco; Don Porfirio Pereira, Minister of Public Works and Telecommunications; Emilio P. Villasanti, Director Foreign Affair, Antelco; Miguel Horacio Gini, Director, Radio Communications, Antelco

Instituto Paraguuayo de Telecomunicaciones
E. Victor Haedo y Hernandarias
Casilla Correo 1047
Asuncion, Paraguay
Telephone: +595 21 493219
Telex: 245 py IPT

Broadcasting Services

Television Cerro Cora - Canal 9
Ave Carlos A. Lopez, 572
Asuncion, Paraguay
Telephone: +595 21 81 710 or 744
Fax: +595 21 84 226
Telex: +399 305 370

Teledifusora Paraguaya - Canal 13
Chile 993
Asunsion, Paraguay
Telephone: +595 21 32 823 or 826
Fax: +595 21 212 809
Telex: +399 0305 370

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Administracion Nacional de Telecominicaciones (Antelco Paraguay)
Ownership: 0.161000%
Earth stations:
Aregua (AOR primary) 335.5

Range of Geostationary Satellites Visible

Location	Asuncion
Lat.°	25.2S
Long.°	57.5W
°Long. Differ. Visible	75°
Eastern Limit for GSO	19°E
Western Limit for GSO	227°E (153°W)

■ PERU

Official name: Republic of Peru
Capital: Lima
ITU country abbreviation: PRU
ITU Region: 2

International telephone dialing code: 51
International telex dialing code: 394

Demographic and Physical Information

Area: 1.29 million km²
Population: 24.09 million
Major languages: Spanish and Quechua (both official); Aymara
Time zones: GMT - 5h

Telecommunications Statistics

Number of telephones: 544,000
Submarine cable connections: none
Radio stations: 273 AM, 144 shortwave
Television standard: NTSC M
Electrical standard: 110 and 220 vac, 60 Hz; 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 7
Television stations: 140
Television sets: NA
TV households: 1.6 million
Cable penetration: NA
VCR penetration: 45%
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Ministerio de Transportes y Comunicaciones
Direccion General de Telecomunicaciones, Av. 28 de Julio, 800, Lima 1, Peru
+51 14 230752

Officials
Francisco Rodriguez Zuniga, Director-General, Telecommunications

Empresa Nacional de Telecomunicaciones (Entel)
Jr. Morelli 270
San Borja
Lima 29000, Peru
Telephone: + 51 14 424300
Telex: 25522 entelpru pe

Officials
Dr. Rollin Throne Valega, Presidents del Directorio

Compañia Peruana de Telefonos S.A.
Av. Arequipa
Lima 16, Peru
Telephone: +51 14 710002

Officials
Sr. Jesus Guzman Gallardo, Presidente de Directorio, C.P.T.

Broadcasting Services

Compania Peruana de Radiodifusion - Canal 4
Montero Rosas 1099
Santa Beatriz, Lima, Peru
Telephone: +51 14 72 89 85
Fax: +51 14 71 95 82
Telex: +394 036 20217

Pananmerica Television S.A. - Canal 5
Ave. Arequipa 1110
A.P. 4392
Lima 1, Peru
Telephone: +51 14 70 85 55
Fax: +51 14 70 69 47
Telex: +394 036 25679

Empresa de Cine Radio y Television Peru - Canal 7
Jose Galvez 1040
Santa Beatriz
Lima 14, Peru
Telephone: +51 14 71 55 70
Fax: +51 14 72 67 99
Telex: +390 250 29

Latino Americana de Radiodifusion S.A. - Canal 2 TV
Martin Dulanto 101
San Antonio
Lima 18, Peru
Telephone: +51 14 71 41 87
Fax: +51 14 71 26 88
Telex: +390 25795

Cine Television Continental - CTVC
Casilla Postal 1045
Lima 1, Peru
Telephone: +51 14 31 69 29
Fax: +51 14 33 29 78
Telex: +390 25963

Andina de Television - Canal 9
Arequipa 3560
San Isidro
Lima, Peru
Telephone: +51 14 40 68 98

Unitel - Canal 2
Calle Roma 160
Lima 18, Peru
Telephone: +51 14 46 50 38/45 52 42/47 11 69
Fax: +51 14 46 05 53

Empresa Radiodifusion - Canal 33
Jr. Huaraz 2098
Pueblo Libre
Lima, Peru
Telephone: +51 14 31 79 14
Fax: +51 14 31 63 65
Telex: +390 203789

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Empresa Nacional de Telecommunicaciones del Peru (Entel Peru)
Ownership: 0.812826%
Earth stations:
Lurin (AOR primary) 335.5
Miguel Colina Marie (AOR major path) 325.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Empresa Nacional de Telecommunicaciones del Peru (Entel Peru)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Lima
Lat.°	12.0S
Long.°	77.0W
°Long. Differ. Visible	76°
Eastern Limit for GSO	359°E (1°W)
Western Limit for GSO	207°E (157°W)

PHILIPPINES

Official name: Republic of the Philippines
Capital: Manila
ITU country abbreviation: PHL
ITU Region: 3

International telephone dialing code: 63
International telex dialing code: 712, 722, 732, 742, 762

Demographic and Physical Information

Area: 300,000 km²
Population: 73.3 million
Major languages: Philipino, English
Time zones: GMT + 8h

Telecommunications Statistics

Number of telephones: 872,900
Submarine cable connections: 5
Radio stations: 267 AM, 55 FM
Television standard: NTSC M
Electrical standard: 110 vac, 60 Hz
State-run television networks: 1
Private television networks: 4
Television stations: 33
Television sets: 4 million
TV households: 4 million
Cable penetration: NA
VCR penetration: 23%
Satellite Earth stations: 1 Intelsat IOR, 2 Intelsat POR

Telecommunications Regulatory Organization

Department of Transportation and Communications
National Telecommunications Commission, Vibal Building, Epifanio de los Santos Avenue, Corner Times Street, Quezon City, Philippines
Telephone: +63 2 981160
Fax: +63 2 9217128

Officials
Pete Nicomedes Prado, Secretary; Josefina Trinidad Lichauco, Undersecretary for Communications

Broadcasting Services

ABS/CBN Channel 2
Mother Ignacia
Corner E.A. Esguerra Ave.
Quezon City, Philippines
Telephone: +63 2 99 45 10 to 19
Fax: +63 2 924 1568
Telex: +722 65814 ABSCBN PN

GMA Channel 7
Broadcast City, Capital Hill, Diliman
Quezon City, Philippines
Telephone: +63 2 99 70 21
Fax: +63 2 922 7954
Telex: +722 27899

RPN Channel 9
Broadcast City, Capital Hill, Diliman
Quezon City, Philippines
Telephone: +63 2 96 86 12
Fax: +63 2 96 85 56
Telex: +722 63886

IBC Channel 13
Broadcast City, Capitial Hill, Diliman
Quezon City, Philippines
Telephone: +63 2 97 76 61
Telex: +722 63886

PTV Channel 4
Bohol Avenue
Quezon City, Philippines
Telephone: +63 2 921 6160 or 921 6969
Telex: +722 42220

Other Recognized Operators

Capital Wireless Inc.
6/F Dolmar Gold Tower
107 Carlos Palanca Jr.
Legaspi Village
Makati Metro Manila, Philippines
Telephone: +63 2 8159961 to 65
Fax: +63 2 8175410
Telex: (75) 14899 cwi hq ps

Globe-Mackay Cable and Radio Corp.
669 United Nations Avenue
P.O. Box 770 Maila 1000
Ermita Metro Manila, Philippines
Telephone: +63 2 5213550
Telex: 40005 pm gmer

Philippine Communications Satellite Corp.
Telecom Plaza
Gil J. Puyat Ave.
Makati Metro Manila, Philippines
Telephone: +63 2 8158406
Telex: philcom 722 2196 potc ph

Philippines Global Communications Inc.
8755 Paseo de Roxas
CC P.O. Box 960
Makati Metro Manila 3117, Philippines
Telephone: +63 2 879971
Telex: (752) 2222 eng ph

Philippines Long Distance Telephone Co.
Ramon Cojuangco Bldg.
Legaspi Village
P.O. Box 952 MCC
Makati Metro Manila, Philippines
Telephone: + 63 2 8174600
Telex: rca 722 22195

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Philippine Communications Satellite Corporation (Philcomsat)
Ownership: 0.640919%
Earth stations:
Pinguay 1 (POR primary) 174.0
Pinguay 2 (IOR primary) 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Philippine Communications Satellite Corporation (Philcomsat)
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Manila
Lat.°	14.7N
Long.°	121.0E
°Long. Differ. Visible	76°
Eastern Limit for GSO	197°E
Western Limit for GSO	45°E

PITCAIRN ISLANDS (UNITED KINGDOM)

Official name: Pitcairn, Henderson, Ducie and Oeno Islands
Capital: Adamstown
Status: dependent territory of the United Kingdom
ITU abbreviation: PTC
ITU Region: 3

International telephone dialing code: NA
International telex dialing code: NA

Demographic and Physical Information
Area: 47 km²
Population: 73
Major languages: English (official), Tahitian
Time zones: GMT - 8h

Telecommunications Statistics
Number of telephones: 24
Submarine cable connections: none
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: none

Range of Geostationary Satellites Visible

Location	Pitcairn
Lat.°	25.1S
Long.°	130.1W
°Long. Differ. Visible	75°
Eastern Limit for GSO	205°E
Western Limit for GSO	305°E (55°W)

POLAND

Official name: Republic of Poland
Capital: Warsaw
ITU country abbreviation: POL
ITU Region: 1

International telephone dialing code: 48
International telex dialing code: 063

Demographic and Physical Information
Area: 312,680 km²
Population: 38.79 million
Major languages: Polish
Time zones: GMT

Telecommunications Statistics
Number of telephones: 4.9 million
Submarine cable connections: none
Radio stations: 27 AM, 27 FM
Television standard: VHF: SECAM D; UHF: SECAM K
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 40 (5 Russian repeaters)
Television sets: 9.6 million
TV households: 9.6 million
Cable penetration: 2%
VCR penetration: 20%
Satellite Earth stations: Intelsat, Intersputnik, Inmarsat, Eutelsat

Telecommunications Regulatory Organization
Ministrestwo Lacznosci
Pl. Malachoskiego 2,
00-940 Warsaw, Poland

Officials
Jerzy W. Slzak, Minister

Telecommunications Operator
Dyrekcja Generalna PPTT
Pl. Malachowskiego 2
00-940 Warsaw, Poland
Telephone: 22 261411 or 261071
Fax: 22 261071
Telex: 063 813301 pptt pl

Official
Kazimierz Cwiek, Director General

Broadcasting Services
Telewizia Polska
17 Jana Pawla Woronicza Street
00 950 Warsaw, Poland
Telephone: 22 443251
Fax: 22 44 02 06
Telex: 06381533

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.20022%

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)
International Telecommunications Satellite Organization (Intelsat)
Signatory: Gentel
Ownership: 0.547%
Earth stations:
Psary (AOR primary) 335.5
International Maritime Satellite Organization (Inmarsat)
Signatory: Ministry of Transportation and Maritime Economy
Ownership: 0.42527%
Earth station:
Psary (AORE)
Psary (IOR)

Range of Geostationary Satellites Visible

Location	Warsaw
Lat.°	52.2N
Long.°	21.0E
°Long. Differ. Visible	67°
Eastern Limit for GSO	88°E
Western Limit for GSO	314°E (46°W)

PORTUGAL

Official name: Portuguese Republic
Capital: Lisbon
ITU country abbreviation: POR
ITU Region: 1

International telephone dialing code: 351
International telex dialing code: 0404

Demographic and Physical Information
Area: 92,080 km²
Population: 10.56 million
Major languages: Portuguese
Time zones: GMT

Telecommunications Statistics
Number of telephones: 2.69 million
Submarine cable connections: 6
Radio stations: 57 AM, 66 FM (22 repeaters)
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 66 (23 repeaters)
Television sets: NA
TV households: 2.9 million
Cable penetration: NA
VCR penetration: 29%
Satellite Earth stations: 2 Intelsat AOR, 1 Intelsat IOR, Eutelsat

Telecommunications Regulatory Organization
Instituto das Comunicacoes de Portugal
Avenida José Malhoa, Lote 1683 - 7°
1000 Lisbon, Portugal
Telephone: 1 7269223
Fax: 1 7263749
Telex: 0404 66335

Officials
Joaguim M. Ferreira do Amaral, Minister of Public Works and Transport; Fernando Rodreigues Mendes,President, Administrative Council

Telecommunications Operator

Telecom Portugal
Gabinete de Organismos Internacionais
Av. Fontes Pereira de Melo, 40-10º
P-1089 Lisboa Codex, Portugal
Telephone: 1 540020
Fax: 1 579941
Telex: 0404 65722 dgt p

Broadcasting Services

Radiotelevisao Portuguese
Ave 5 de Outubro, 197
P-1094 Lisbon Codex, Portugal
Telephone: 1 793 1774
Fax: 1 796 6227
Telex: +832 14527

Other Recognized Operators

Companhia Portuguesa Rádio Macrconi
Apartado 2778
P-1119 Lisboa Codex, Portugal
Telephone: 1 3524191
Fax: 1 451258
Telex: 12384 cprm p

Telefones de Lisboa e Porte (TLP), S.A.
Gabinete de Relacôes Internacionais
Rua Andrade Corvo, 30-4º
P-1200 Lisboa, Portugal
Telephone: 1 326677
Fax: 1 3967422
Telex: 12248 transfer p

Servicos Radioelétricos do Sul
Alto do Paimâo
Barcarena
2745 Queluz, Portugal
Telephone: 1 4352430
Fax: 1 4351332
Telex: 12627 cfrs p

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 2.50834%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Companhia Portuguesa Radio Marconi
Ownership: 0.619760%
Earth stations:
Funchal 1 (AOR spare) 307.0
Ponta Delgada 1 (AOR spare) 307.0
Ponta Delgada 2 (AOR spare) 359.0
Sintra 1 (AOR primary) 335.5
Sintra 2 (AOR spare) 307.0
Sintra 3 (IOR primary) 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Companhia Portuguesa Radio Marconi
Ownership: 0.26280%
Earth station: none

Range of Geostationary Satellites Visible

Location	Lisbon
Lat.°	38.7N
Long.°	9.2W
° Long. Differ. Visible	72°
Eastern Limit for GSO	82°E
Western Limit for GSO	297°E (63°W)

PUERTO RICO (UNITED STATES)

Official name: Commonwealth of Puerto Rico
Capital: San Juan
Status: commonwealth associated with the United States
ITU abbreviation: PTR
ITU Region: 2

International telephone dialing code: 1+809 (to be changed to 787 beginning 3/1/96)
International telex dialing code: 345, 365, 385

Demographic and Physical Information

Area: 9,104 km²
Population: 3.81 million
Major languages: Spanish, English
Time zones: GMT -6h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 50 AM, 63 FM
Television standard: NTSC M
Electrical standard: 120 vac, 60 Hz
State-run television networks: 1
Private television networks: 9
Television stations: 9
Television sets: NA
TV households: 900,000
Cable penetration: 25%
VCR penetration: 65%
Satellite Earth stations: 1 Intelsat

Telecommunications Regulatory Organization

Puerto Rico Communications Authority
P.O. Box 13963
Santurce, PR 00908
Telephone: +1(809) 7212255
Telex: (209) 9611

Broadcasting Services

Telemundo - Canal 2
383 Ave. Roosevelt
San Juan, PR 00936
Telephone: +1(809) 758 2222
Fax: +1(809) 759 9655
Telex: +345/365/385 0205 2774

WAPA TV Broadcasting Corporation - Canal 4
Gpo. Box 2050
San Juan, PR 00936
Telephone: +1(809) 792 4444
Fax: +1(809) 782 4420
Telex: +345/365/385 0205 or 0245

Canal 7
Edifico Smallwood, Calle 3
Parada 8, Puerta de Tierra
San Juan, PR 00902
Telephone: +1(809) 724 7777
Fax: +1(809) 724 1348

Canal 11
Ave. Condado 657
Santurce, PR 00908
Telephone: +1(809) 724 1111
Fax: +1(809) 721 0777

Canal 24
Quisquella 1 71
Piso 4 - Hato Ray, PR 00936
Telephone: +1(809) 766 0024
Fax: 1(809) 753 0130

Canal 40 - PBS
Carretera 176
de Rio Piedras a Cupey Bajo
Telephone: +1(809) 766 2600
Fax: +1(809)250 8546

Other Recognized Operators

Puerto Rico Telephone Company
GPO Box 998
San Juan, PR 00936
Telephone: +1(809) 7828282

Communications Corporation of Puerto Rico
P.O. Box 11248
Fernandez Juncos, San Jose, PR 00910
Telephone: +1(809) 7313131

Range of Geostationary Satellites Visible

Location	San Juan
Lat.°	18.5N
Long.°	66.1W
° Long. Differ. Visible	76°
Eastern Limit for GSO	10°E
Western Limit for GSO	218°E (142°W)

QATAR

Official name: State of Qatar
Capital: Doha
ITU country abbreviation: QAT
ITU Region: 1

International telephone dialing code: 974
International telex dialing code: 0497

Demographic and Physical Information

Area: 11,000 km²
Population: 533,916
Major languages: Arabic (official), English
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 110,000
Submarine cable connections: 2
Radio stations: 2 AM, 3 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 3
Television sets: NA
TV households: 150,000
Cable penetration: none
VCR penetration: 53%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR, Arabsat

Telecommunications Regulatory Organization

Qatar Public Telecommunication Corporation (Q-Tel)
P.O. Box 217
Doha, Qatar
Telephone: 400333
Fax: 413904
Telex: 0497 4468

Officials

Abdullah Bin Saleh Al-Mana, Minister of Communications and Transport; Abdullah Hussain Al-Salat, Undersecretary of State, Communication/Transport; Ezzat Mohammed Al-Rashid, General Manager, Q-Tel

Broadcasting Services

Qatar Broadcasting Service
Ministry of Information
P.O. Box 1414
Doha, Qatar
Telephone: 86411
Fax: 86 43 95
Telex: 0497 4040

Qatar TV
P.O. Box 1836
Doha, Qatar
Telephone: 8464575
Telex: 0497 4040 teevee dh

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat); investment share 9.81%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Qatar Public Telecommunications Corporation (Q-Tel)
Ownership: 0.295682%
Earth stations:
Doha 1 (IOR primary) 60.0
Doha 2 (AOR major path) 342.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Qatar Public Telecommunications Corporation (Q-Tel)
Ownership: 0.09961%
Earth station: none

Range of Geostationary Satellites Visible

Location	Doha
Lat.°	25.2N
Long.°	51.6E
° Long. Differ. Visible	75°
Eastern Limit for GSO	127°E
Western Limit for GSO	336°E (24°W)

REUNION (FRANCE)

Official name: Department of Réunion
Status: overseas department of France
Capital: Saint-Denis
ITU abbreviation: none
ITU Region: 3

International telephone dialing code: 262
International telex dialing code: NA

Demographic and Physical Information

Area: 2,510 km²
Population: 666,067
Major languages: French (official); Creole
Time zones: GMT + 4h

Telecommunications Statistics

Number of telephones: 85,900
Submarine cable connections: NA
Radio stations: 3 AM, 13 FM
Television standard: SECAM
Electrical standard: NA
State-run television networks: 1
Private television networks: none
Television stations: 1 (18 repeaters)
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Range of Geostationary Satellites Visible

Location	St. Denis
Lat.°	21.0S
Long.°	56.0E
° Long. Differ. Visible	76°
Eastern Limit for GSO	132°E
Western Limit for GSO	340°E (20°W)

ROMANIA

Official name: Romania
Capital: Bucharest
ITU country abbreviation: ROU
ITU Region: 1

International telephone dialing code: 40
International telex dialing code: 065

Demographic and Physical Information

Area: 237,500 km²
Population: 23.2 million
Major languages: Romanian, Hungarian, German
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 2.3 million
Submarine cable connections: none
Radio stations: 12 AM, 5 FM
Television standard: VHF: PAL D; UHF: PAL K
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 13
Television sets: NA
TV households: 4 million
Cable penetration: none
VCR penetration: 12%
Satellite Earth stations: 1 Intelsat

Telecommunications Regulatory Organization

Ministere des Communications
General Directorate of Regulation
14, Blvd. Libertätii, 14
70060-Bucharest, Romania
Telephone: 1-400-1575
Fax: 1-400-1230
Telex: 065 11372

Officials

Andrei Chiricä, Minister of Communications
Cantemir Ionescu, Director General

Broadcasting Services

Radio Televiziunea Romania - TVR - Calea
Dorobantilor 191
Bucharest Sector 1
Telephone: 633 5031
Fax: 633 7544
Telex: 065 11251/10182

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory:Ministry of Posts and Telecommunications of Romania
Ownership: 0.050000%
Earth stations:
Cheia 1 (AOR primary) 335.5
Cheia 2 (IOR promary) 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Ministry of Posts and Telecommunications of Romania
Ownership: 0.05%
Earth station: none

Range of Geostationary Satellites Visible

Location	Bucharest
Lat.°	44.4N
Long.°	26.2E
°Long. Differ. Visible	71°
Eastern Limit for GSO	97°E
Western Limit for GSO	315°E (45°W)

■ RUSSIA (RUSSIAN FEDERATION)

Official name: Russian Federation
Capital: Moscow
ITU country abbreviation: RUS
ITU Region: 1

International telephone dialing code: 7
International telex dialing code: 064

Demographic and Physical Information

Area: 17.08 million km²
Population: 149.91 million
Major languages: Russian
Time zones: GMT + 3h to GMT + 12h

Telecommunications Statistics

Number of telephones: 24.4 million
Submarine cable connections: some
Radio stations: 1,050 (total AM, FM, and shortwave)
Television standard: VHF: SECAM D; UHF: SECAM K
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: NA
Television stations: 7,183
Television sets: 54.2 million
TV households: NA
Cable penetration: NA
VCR penetration: 3%
Satellite Earth stations: Intelsat, Inmarsat, Intersputnik, Orbita, Eutelsat

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
7, Tverskaya Street
1033 Moscow, Russia
Telephone: 095 9255108
Fax: 095 2302097
Telex: 064 442 961

Officials

Alexsander E. Krupnov, Director-General, International Cooperation Dept.; Vladimir B. Bulgak, Minister of Posts and Telecommunications

Broadcasting Services

Ostankino
12, Korolyova Street
Moscow 127427, Russia
Telephone: 095 217 7453
Fax: 095 217-9546

Russian State Television & Radio Broadcasting Company - RTR
5 Ulitsa Lamskogo Polya, 19/21
125124 Moscow, Russia
Telephone: 095 251-6740
Fax: 095 250 0506

Other Recognized Operators

Comincom
2nd. Spasonalivkovsky Side-street 6
117909 Moscow, Russia
Telephone: 095-238-3254
Fax: 095-238-2242
Telex: 064 411235

Comstar
Krasnostudenchesy Pr. 2A
127434 Moscow, Russia
Telephone: 095-210-3369
Fax: 095-200-3283/210-9986

Intertelecom
5 Delegatskaya St.
103091 Moscow, Russia
Telephone: 095-292-6736
Fax: 095-924-7062

Intsviaz
25 Dubovaya Roscha
127427 Moscow, Russia
Telephone: 095-230-2085
Fax: 095-230-2946
Telex: 064 411874

Russian Satellite Communication Company
Ul. Shabolovka 37
113162 Moscow, Russia
Telephone: 095-232-3184
Fax: 095-234-0328
Telex: 064-411405

International Telecommunications Organization Membership

International Organization of Space Communications (Intersputnik)
International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Posts and Telecommunications of the Russian Federation
Ownership: 0.050000%
Earth stations:
Dubna (AOR primary) 335.5
Lvov (AOR major path) 325.5
Lvov 2 (IOR primary) 60.0
Moscow 1 (IOR major path) 63.0
Moscow 2 (AOR primary) 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Morsviasputnik
Ownership: 4.35741%
Earth stations:
Nakhodka (POR)
Odessa (AORE)
Odessa (IOR)

Domestic Satellite Network

Operator: Ministry for Postal Services and Telecommunications
Telephone: 95 925-5108
Fax: 95 230-2097
Telex: 064 412961, 411120

Satellites:

Statsionar-1 (Raduga)	349° E (11° W)
Statsionar-2 (Raduga)	35° E
Statsionar-3 (Raduga)	85° E
Statsionar-4 (Gorizont)	346° E (14° W)
Statsionar-5 (Gorizont)	53° E
Statsionar-6 (Gorizont)	90° E
Statsionar-7 (Gorizont)	140° E
Statsionar-8 (Raduga)	335° E (25° W)
Statsionar-9 (Raduga)	45° E
Statsionar-10 (Raduga)	190° E (170° W)
Statsionar-12 (Gorizont)	40° E
Statsionar-13 (Gorizont)	80° E
Statsionar-14 Gorizont)	96.5° E
Statsionar-15 (Raduga)	128° E
Statsionar-16	145° E
Statsionar-20 (Raduga)	70° E
Statsionar-21 (Gorizont)	103° E

Statsionar-24 (Raduga)	49° E
Statsionar-T Ekran	99° E
Loutch-1	346° E (14° W) (on Statsionar-4)
Loutch-2	53° E (on Statsionar-5)
Loutch-3	90° E (on Statsionar-6)
Loutch-4	140° E (on Statsionar-7)
Loutch-5	103° E (on Statsionar-21)
Loutch-6	349° E (11° W) (on Statsionar1)
Loutch-7	40° E (on Statsionar-12)
Loutch-8	80° E (on Statsionar-13)
Loutch-9	96.5° E (on Statsionar-14)
Molniya	(4 non-geosynchronous satellites)
Volna-2	346° E (14° W)(on Statsionar 4)
Volna-4	53° E (on Statsionar-5)
Volna-6	140° E (on Statsionar 7)
Volna-8	90° E (on statsionar-6)
Loutch K-1897	95° E
Loutch K-2054	344° E (16° W)

Range of Geostationary Satellites Visible

Location	Arkhangelsk
Lat.°	64.7N
Long.°	41.0E
° Long. Differ. Visible	57°
Eastern Limit for GSO	98°E
Western Limit for GSO	344°E (16°W)

Location	Moscow
Lat.°	55.7N
Long.°	37.6E
° Long. Differ. Visible	66°
Eastern Limit for GSO	103°E
Western Limit for GSO	332°E (22°W)

Location	Novosibirsk
Lat.°	55.0N
Long.°	83.1E
° Long. Differ. Visible	66°
Eastern Limit for GSO	149°E
Western Limit for GSO	17°E

Location	Petropavlovsk Kamchatsky
Lat.°	53.0N
Long.°	158.4E
° Long. Differ. Visible	67°
Eastern Limit for GSO	226°E
Western Limit for GSO	91°E

Location	St. Petersburg
Lat.°	59.9N
Long.°	30.3E
° Long. Differ. Visible	62°
Eastern Limit for GSO	93°E
Western Limit for GSO	328°E (32°W)

Location	Vladivostok
Lat.°	43.2N
Long.°	131.9E
° Long. Differ. Visible	71°
Eastern Limit for GSO	203°E
Western Limit for GSO	61°E

■ RWANDA

Official name: Republic of Rwanda
Capital: Kigali
ITU country abbreviation: RRW
ITU Region: 1
International telephone dialing code:250
International telex dialing code: NA

Demographic and Physical Information

Area: 26,340 km²
Population: 8.61 million
Major languages: French, Kinyarwanda (both official)
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 1 AM, 1 FM
Television standard: K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministere des Transportes et des Communications
B.P. 720
Kigali, Rwanda
Telephone: +250 75304
Fax: +250 76836
Telex: 0909 22524

Officials

Alphonse Higaniro, Minister of Transport and Communications; Secretary-General, Transport and Communications
Monsieur le Directeur général des télécommunications
BP 1332
Kigali, Rwanda
Telephone: +250 76777
Fax: +250 73110
Telex: 22573 dirgeneral rw

Officials

M. Assumani Bizimana, Directoer Général de Télécommunications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministere des Transports et des Communications de la Republique Rwandais
Ownership: 0.05000%
Earth stations: IOR

Range of Geostationary Satellites Visible

Location	Kigali
Lat.°	2.0S
Long.°	30.1E
° Long. Differ. Visible	76°
Eastern Limit for GSO	107°E
Western Limit for GSO	314°E (46°W)

■ SABA (NETHERLANDS)

Range of Geostationary Satellites Visible

Location	Saba
Lat.°	17.7N
Long.°	63.4W
° Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	221°E (139°W)

■ ST. CHRISTOPHER

see St. Kitts and Nevis

Range of Geostationary Satellites Visible

Location	St. Kitts
Lat.°	17.3N
Long.°	62.7W
° Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	221°E (139°W)

■ ST. CROIX (UNITED STATES)

see Virgin Islands (U.S.)

Range of Geostationary Satellites Visible

Location	St. Croix
Lat.°	17.7N
Long.°	64.7W
° Long. Differ. Visible	76°
Eastern Limit for GSO	11°E
Western Limit for GSO	219°E (141°W)

ST. EUSTATIUS (NETHERLANDS)

Range of Geostationary Satellites Visible

Location	St. Eustatius
Lat.°	17.3N
Long.°	63.0W
° Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	221°E (139°W)

ST. HELENA (UNITED KINGDOM)

(includes Ascension Island, Gough Island, Inaccessible Island, Nightingale Island, and Tristan da Cunha)

Status: dependent territory of the United Kingdom
Capital: Jamestown
ITU abbreviation: SHN
ITU Region: 1

International telephone dialing code: 290
International telex dialing code: NA

Demographic and Physical Information

Area: 410 km²
Population: 6,762
Major languages: English
Time zones: GMT

Telecommunications Statistics

Number of telephones: 550
Submarine cable connections: several
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

The Postmaster
General Post Office, St. Helena

Cable and Wireless plc
P.O. Box 2
The Briars, St. Helena
Telephone: +290 2200

Range of Geostationary Satellites Visible

Location	Jamestown
Lat.°	15.9S
Long.°	5.7W
° Long. Differ. Visible	76°
Eastern Limit for GSO	70°E
Western Limit for GSO	278°E (82°W)

ST. JOHN

see Virgin Islands (U.S.)

ST. KITTS AND NEVIS

Official name: Federation of Saint Kitts and Nevis
Capital: Basseterre
ITU country abbreviation: SCN
ITU Region: 2

International telephone dialing code: 1+809
(to be changed to 869 at a future date)
International telex dialing code: 361

Demographic and Physical Information

Area: 269 km²
Population: 40,992
Major languages: English
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 2,400
Submarine cable connections: none
Radio stations: 2 AM
Television standard: NTSC M
Electrical standard: 230 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 4
Television sets: NA
TV households: 9,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

The Permanent Secretary Ministry of Communications, Works, Utilities, Posts and Telegraph
Government Headquarters
St. Kitts, St. Kitts and Nevis

Broadcasting Services

ZIZ Radio and Television
P.O. Box 331
Springfield
St. Kitts, St. Kitts and Nevis
Telephone: +1(809) 465 2621
Fax: +1(809) 465 5205
Telex: +361 6820 EXTNL SKB KC

Other Recognized Operators

St. Kitts and Nevis Telecommunications Ltd.
P.O. Box 86
Basseterre
St. Kitts, St. Kitts and Nevis
Telephone: +1(809) 4651000
Telex: 6870 skantel kc

International Telecommunications Organization Membership

none

Range of Geostationary Satellites Visible

Location	Basseterre
Lat.°	17.3N
Long.°	62.7W
° Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	223°E (137°W)

ST. LUCIA

Official name: Saint Lucia
Capital: Castries
ITU country abbreviation: LCA
ITU Region: 2

International telephone dialing code: 1+809
(to be changed to 758 at a future date)
International telex dialing code: 341

Demographic and Physical Information

Area: 620 km²
Population: 156,050
Major languages: English (official); French patois
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 9,500
Submarine cable connections: none
Radio stations: 4 AM, 1 FM
Television standard: NA
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministry of Communications and Works
Castries
St. Lucia
Telephone: +1(809) 452 2611

Broadcasting Services

Helen Television System
The Moene
P.O. Box 621
Castries, St. Lucia
Telephone: +1(809) 452 2693/4982
Fax: +1(809) 453 1737
Telex: +341 6254

Other Recognized Operators

Cable and Wireless (W.I.) Ltd.
Bridge Street
P.O. Box 111
Casties, St. Lucia
Telephone: +1(809) 4523301
Telex: 6319 cwadm lc

International Telecommunications Organization Membership

International Telecommunications Union
International Telecommunications Satellite Organization (Intelsat)
Signatory: Cable and Wireless
Owership: NA
Earth stations: St Lucia (AOR major path) — 341.5

Range of Geostationary Satellites Visible

Location	Castries
Lat.°	14.0N
Long.°	61.0W
°Long. Differ. Visible	76°
Eastern Limit for GSO	15°E
Western Limit for GSO	223°E (137°W)

ST. MAARTEN (NETHERLANDS)

see Netherlands Antilles

Range of Geostationary Satellites Visible

Location	St. Maarten
Lat.°	18.0N
Long.°	63.1W
°Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	221°E (139°W)

ST. MARTIN (FRANCE)

Range of Geostationary Satellites Visible

Location	St. Martin
Lat.°	18.0N
Long.°	63.0W
°Long. Differ. Visible	76°
Eastern Limit for GSO	13°E
Western Limit for GSO	221°E (139°W)

ST. PIERRE AND MIQUELON (FRANCE)

Status: territorial collectivity of France
Capital: Saint Pierre
ITU abbreviation: none
ITU Region: 2

International telephone dialing code:508
International telex dialing code: NA

Demographic and Physical Information

Area: 242 km²
Population: 6,757
Major languages: French
Time zones: GMT - 3h30m

Telecommunications Statistics

Number of telephones: 3,601
Submarine cable connections: none
Radio stations: 1 AM, 3 FM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 French domestic system

Range of Geostationary Satellites Visible

Location	St. Pierre
Lat.°	46.9N
Long.°	56.2W
°Long. Differ. Visible	70°
Eastern Limit for GSO	14°E
Western Limit for GSO	234°E (136°W)

ST. THOMAS (UNITED STATES)

see Virgin Islands (U.S.)

Range of Geostationary Satellites Visible

Location	St. Thomas
Lat.°	18.4N
Long.°	64.9W
°Long. Differ. Visible	76°
Eastern Limit for GSO	11°E
Western Limit for GSO	219°E (141°W)

ST. VINCENT AND THE GRENADINES

Official name: Saint Vincent and the Grenadines
Capital: Kingstown
ITU country abbreviation: VCT
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: NA

Demographic and Physical Information

Area: 340 km²
Population: 117,344
Major languages: English, French patois
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 6,500
Submarine cable connections: NA
Radio stations: 2 AM
Television standard: NA
Electrical standard: 230 vac, 50 Hz
State-run television networks: NA
Private television networks: NA
Television stations: 1 (cable)
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

The Permanent Secretary
Ministry of Communications, Works and Labor
Kingstown, St. Vincent and the Grenadines

Officials

Judith Leigertwood, Permanent Secretary; Donnie De Freitas, Telecommunication Officer; Jeremiah Scott, Minister of Communications and Works

Other Recognized Operators

Cable and Wireless (W.I.) Ltd.
Halifax Street
P.O. Box 103
Kingston, St. Vincent and Grenadines
Telephone: +1(809) 4571901
Telex: 7502 cwadmin vq

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Kingstown
Lat.°	13.2N
Long.°	61.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	15°E
Western Limit for GSO	223°E (137°W)

■ SAIPAN

see Northern Marianas Islands

■ SAMOA, AMERICAN

see American Samoa

■ SAN MARINO

Official name: Republic of San Marino
Capital: San Marino
ITU country abbreviation: SMR
ITU Region: 1

International telephone dialing code: 378
International telex dialing code: NA

Demographic and Physical Information

Area: 60 km²
Population: 24,313
Major languages: Italian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 11,700
Submarine cable connections: none
Radio stations: none (services from Italy)
Television standard: none (services from Italy)
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization

Direzione Generale Poste e Telecomunicazioni
San Marino, San Marino
Telephone: 549 882555
Fax: 549 992760

Officials

Augusto Casali, Minister of Posts and Telecommunications; Luciano Capicchioni, Director-General; Ivo Grandoni, Technical Adviser

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	San Marino
Lat.°	43.9N
Long.°	12.4E
°Long. Differ. Visible	71°
Eastern Limit for GSO	84°E
Western Limit for GSO	301°E (59°W)

■ SAO TOME AND PRINCIPE

Official name: Democratic Republic of São Tomé and Principe
Capital: São Tomé
ITU country abbreviation: STP
ITU Region: 1

International telephone dialing code: 239
International telex dialing code: NA

Demographic and Physical Information

Area: 960 km²
Population: 140,423
Major languages: Portuguese (official)
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 1 AM, 2 FM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Companhia Santomense de Telecomunicacoes, Sarl
Caixa Postal 141
Sao Tome, Sao Tome and Principe
Telephone: +239 12 22500
Fax: + 239 12 21324

Officials

Fernando José Paquete da Costa, Secretary of State, Transport and Communications

Broadcasting Services

Radio Nacional de Sao Tome e Principe
Avenida Marginal 12 de Julho
Caixa postal 44
Sao Tome, Sao Tome and Principe
Telephone: +239 12 22875
Telex: 217 radio st

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	São Tomé
Lat.°	0.2N
Long.°	6.6E
°Long. Differ. Visible	77°
Eastern Limit for GSO	84°E
Western Limit for GSO	290°E (70°W)

■ SARAWAK (INDONESIA)

Range of Geostationary Satellites Visible

Location	Sarawak
Lat.°	2.0N
Long.°	113.0E
°Long. Differ. Visible	76°
Eastern Limit for GSO	189°E
Western Limit for GSO	37°E

SARDINIA (ITALY)

Range of Geostationary Satellites Visible

Location	Sardinia
Lat.°	39.9N
Long.°	9.0E
°Long. Differ. Visible	72°
Eastern Limit for GSO	81°E
Western Limit for GSO	297°E (67°W)

SAUDI ARABIA

Official name: Kingdom of Saudi Arabia
Capital: Riyadh
ITU country abbreviation: ARS
ITU Region: 1

International telephone dialing code: 966
International telex dialing code: 0495

Demographic and Physical Information

Area: 1.96 million km²
Population: 18.73 million
Major languages: Arabic
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 1.62 million
Submarine cable connections: 3
Radio stations: 43 AM, 13 FM
Television standard: VHF: SECCAM B; UHF: SECAM G
Electrical standard: 127 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 80
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: 41%
Satellite Earth stations: 3 Intelsat AOR, 2 Intelsat IOR, 1 Inmarsat, 1 Arabsat

Telecommunications Regulatory Organization

Ministry of Post, Telegraph, and Telephone
Director-General
Riyadh 11112, Saudi Arabia
Telephone: 1 4637100
Fax: (2/3) 1 4032048
Telex: 0495 401220

Officials

Alawi Daweesh Kayal, Minister of Post, Telegraph, and Telephone; A. Faisal Zaidan, Deputy Minister for Telephones; Mohammed Jamil Mulla, Deputy Minister for Telegraphs; Fouad Mohammad Nour Abu Mansour, Deputy Minister, Operations and Maintenance

Broadcasting Services

Saudi Arabian Television - SJ
P.O. Box 7959
Riyadh 11421, Saudi Arabia
Telephone: 1 406 8888 or 442 8320
Fax: 1 435 9329 or 403 3826
Telex: 0495 401 030

Saudi Aramco - Channel 3 TV
MPOD
Building 3030, LIP
Dhahran 31311, Saudi Arabia
Telephone: 3 875 4634
Fax: 3 874 0238

International Telecommunications Organization Membership

Arab Communications Satellite Organization
Signatory: Government of Saudi Arabia
Ownership: 36.66%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Saudi Arabia
Ownership: 1.870299%
Earth stations:
Jeddah 4 (AOR major path 1) — 325.5
Jeddah 5 (IOR major path) — 63.0
Riyadh 1 (IOR primary) — 60.0
Riyadh 4 (AOR major path 2) — 342.0
Taif (AOR primary) — 335.5
Taif (AOR primary) — 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: Government of Saudi Arabia
Ownership: 1.51317%
Earth station:
Jeddah (IOR)

Range of Geostationary Satellites Visible

Location	Riyadh
Lat.°	27.4N
Long.°	46.7E
°Long. Differ. Visible	75°
Eastern Limit for GSO	122°E
Western Limit for GSO	332°E (22°W)

SENEGAL

Official name: Republic of Sénégal
Capital: Dakar
ITU country abbreviation: SEN
ITU Region: 1

International telephone dialing code: 221
International telex dialing code: 962

Demographic and Physical Information

Area: 196,190 km²
Population: 9.01 million
Major languages: French (official); Wolof, Pulaar
Time zones: GMT

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: 3
Radio stations: 8 AM
Television standard: SECAM K1
Electrical standard: 127 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministere de la Communication
Dakar, Senegal
Telephone: +221 231065

Officials

Moctar Kebe, Minister

Société Nacionale des Télécomunications de Sénégal (SONATEL)
Boîte postale 69
Dankar, Sénégal
Telephone: +221 231023
Fax: +221 221492
Telex: 1296 sntag sg

Broadcasting Services

Office de Radiodiffusion Television du Senegal - ORTS
58 Blvd. de la Republique
P.O. Box 1765
Dankar, Senegal
Telephone: +221 216449 or 215689
Fax: +221 212545
Telex: +962 634

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Republic of Sénégal
Ownership: 0.109776%
Earth stations:
Gandoul (AOR primary) — 335.5

Range of Geostationary Satellites Visible

Location	Dakar
Lat.°	14.6N
Long.°	17.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	58°E
Western Limit for GSO	266°E (94°W)

SERBIA

see Yugoslavia

SEYCHELLES

Official name: Republic of Seychelles
Capital: Victoria
ITU country abbreviation: SEY
ITU Region: 1

International telephone dialing code: 248
International telex dialing code: 997

Demographic and Physical Information

Area: 455 km²
Population: 72,709
Major languages: English and French (both official); Creole
Time zones: GMT + 4h

Telecommunications Statistics

Number of telephones: 13,000
Submarine cable connections: NA
Radio stations: 2 AM
Television standard: PAL
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

The Principal Secretary
Ministry of Finance (Telecommunications Division)
P.O. Box 313
Central Bank Bldg.
Independence Ave.
Victoria, Mahe, Seychelles
Telephone: +248 25252
Fax: +248 25265
Telex: 2363 fintur sz

Other Recognized Operators

Cable and Wireless (Seychelles) Ltd.
P.O. Box 4
Francis Rachel street
Victoria, Mahe, Seychelles
Telephone: +248 2221
Fax: +248 22777
Telex: 2210 cwexex sz

International Telecommunications Organization Membership

none

Range of Geostationary Satellites Visible

Location	Victoria
Lat.°	5S
Long.°	55.7E
°Long. Differ. Visible	76°
Eastern Limit for GSO	132°E
Western Limit for GSO	340°E (20°W)

SIERRA LEONE

Official name: Republic of Sierra Leone
Capital: Freetown
ITU country abbreviation: SRL
ITU Region: 1

International telephone dialing code: 232
International telex dialing code: 989

Demographic and Physical Information

Area: 71,740 km²
Population: 4.75 million
Major languages: English (official); Krio, Mende, Temne
Time zones: GMT

Telecommunications Statistics

Number of telephones: 23,650
Submarine cable connections: none
Radio stations: 1 AM, 1 FM
Television standard: PAL B
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 1
Television sets: NA
TV households: 35,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Sierra Leone National Telecommunications Company (SLNTC)
P.O. Box 15, Tower Hill
Freetown, Sierra Leone
Telephone: +232 22 223333
Fax: +232 223200

Officials
Philipson H. Kamara, Minister of Transport and Communications; H.H. Hempel, Managing Director, SLNTC

Sierra Leone External Telecommunications Ltd.
P.O. Box 80
Freetown, Sierra Leone
Telephone: +23222 222804
Fax: +232 22 224439

Broadcasting Services

Sierra Leone Television
Private Mailbag
Freetown, Sierra Leone
Telephone: +232 22 40 595 or 40 403
Telex: +989 3334

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunication Satellite Organization (Intelsat)
Singatory: Extelco Sierra Leone
Earth stations: Wilberforce (AOR major path) — 325.5

Range of Geostationary Satellites Visible

Location	Freetown
Lat.°	8.5N
Long.°	13.3W
°Long. Differ. Visible	76°
Eastern Limit for GSO	63°E
Western Limit for GSO	270°E (90°W)

SINGAPORE

Official name: Republic of Singapore
Capital: Singapore
ITU country abbreviation: SNG
ITU Region: 3

International telephone dialing code: 65
International telex dialing code: 786

Demographic and Physical Information

Area: 633 km²
Population: 2.8 million
Major languages: Chinese, Malay, Tamil, English (all official)
Time zones: GMT + 8h

Telecommunications Statistics

Number of telephones: 1.11 million
Submarine cable connections: 3
Radio stations: 13 AM, 4 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none

Television stations: 2
Television sets: 600,000
TV households: 600,000
Cable penetration: none
VCR penetration: 76%
Satellite Earth stations: 1 Intelsat IOR, 1 Intelsat POR

Telecommunications Regulatory Organization

Telecommunication Authority of Singapore
Comcenter
31, Exeter Road
Singapore 0923, Singapore
Telephone: +65 738 7788
Fax: +65 733 0073

Officials
H.E. Mah Bow tan, Minister for Communications; Ng Hong Yew, Director General

Other Recognized Operators

Singapore Telecommunications Private Limited (Singapore Telecom)
International Affairs/Regulatory Function
#18-00 Comcentre
31 Exeter Road
Singapore 0923, Singapore
Telephone: +65 734 3344
Fax: +65 733 3351

Broadcasting Services

Singapore Broadcasting Corporation - SBC
Farrer Road
P.O. Box 60
Singapore 9128, Singapore
Telephone: +65 256 0401
Fax: +65 253 8808
Telex: +786 39265

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telecommunications Authority of Singapore/ Telecom Singapore
Ownership: 2.007955%
Earth stations:
Bukit Timah 1 (IOR primary) — 60.0
Bukit Timah 2 (POR primary) — 174.0
SBC 1B (POR spare) — 180.0
Sentosa 1 (IOR major path) — 63.0
Sentosa 2 (POR primary) — 174.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Telecommunications Authority of Singapore
Ownership: NA
Earth station:
Singapore (POR)

Range of Geostationary Satellites Visible

Location	Singapore
Lat.°	1.3N
Long.°	103.8E
°Long. Differ. Visible	76°
Eastern Limit for GSO	180°E
Western Limit for GSO	28°E

■ SLOVAKIA (SLOVAK REPUBLIC)

Official name: Slovak Republic
Capital: Bratislava
ITU country abbreviation: SVK
ITU region: 1

International telephone dialing code: 42

Demographic and Physical Information

Area: 48,845 km²
Population: 5.43 million
Major languages: Slovak (official); Hungarian

Telecommunications Regulatory Organization

Ministry of Transport, Posts and Telecommunications
Mileticovo 19
82006 Bratislava, Slovakia
Telephone: +42 7-647-67
Fax: +42 7-254-800

Official
Roman Hofbauer, Minister of Transport, Posts and Telecommunications

Bureau of Telecommunications
Jarosova ul. 1
83008 Bratislava, Slovakia
Telephone: 7-254-328
Fax: 7-258-971

Official
Jan Ulicky, Director

Telecommunications Operator

Slovak Telecommunications
Námestic Slobody 6
81762 Bratislava, Slovakia
Telephone: 7-496-851-3
Fax: 7-793-718

Official
Vladimir Ondrovic, Director General

Broadcasting Services

Slovak Television
Mlynska Dolina 28
84545 Bratislava, Slovakia
Telephone: 7-725-948
Fax: 7-722-341

Official
Peter Malec, Director

Slovak Radio
Mytna ul. 1
81290 Bratislava, Slovakia
Telephone: 7-497-332
Fax: 7-493-626

Official
Dr. Vladimir Stefko, Director

International Telecommunications Organization Membership

European Satellite Telecommunications Organization (Eutelsat).
Signatory: Sprava Communications; investment share 0.05%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)

International Maritime Satellite Organization (Inmarsat)

Range of Geostationary Satellites Visible

Location	Bratislava
Lat.°	48.2N
Long.°	17.1E
°Long. Differ. Visible	70°
Eastern Limit for GSO	53°E
Western Limit for GSO	273°E (87°W)

■ SLOVENIA

Official name: Republic of Slovenia
Capital: Ljubljana
ITU country abbreviation: SVN
ITU Region: 1

International telephone dialing code: 386
International telex dialing code: 066

Demographic and Physical Information

Area: 20,296 km²
Population: 2.05 million
Major languages: Slovenian, Serbo-Croatian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 130,000
Submarine cable connections: none
Radio stations: 6 AM, 5 FM
Television standard: PAL
Electrical standard: 220 vac, 50 Hz
State-run television networks: Na
Private television networks: NA
Television stations: 7
Television sets: 330,000
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Telecommunications Regulatory Organization

Ministry of Transport and Communications
Telecommunications Authority
Kotnikova 19a
61000 Ljubljana, Slovenia
Telephone: 6-1-131-098
Fax: 6-1-128-036

Official

Marjan Krajnc, Minister of Transport and Communications; Dr. Jose Vugrinec, Director

Range of Geostationary Satellites Visible

Location	Ljubljana
Lat.°	46.1N
Long.°	14.5E
°Long. Differ. Visible	70°
Eastern Limit for GSO	85°E
Western Limit for GSO	305°E (55°W)

SOLOMON ISLANDS

Official name: Solomon Islands
Capital: Honiara
ITU country abbreviation: SLM
ITU Region: 3

International telephone dialing code: 677
International telex dialing code: NA

Demographic and Physical Information

Area: 28,450 km²
Population: 399,206
Major languages: Melanesian pidgin
Time zones: GMT + 11h

Telecommunications Statistics

Number of telephones: 3,000
Submarine cable connections: NA
Radio stations: 4 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
P.O. Box G25
Honiara, Solomon Islands
Telephone: +677 21821
Fax: +677 21472

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Honiara
Lat.°	9.4S
Long.°	159.9E
°Long. Differ. Visible	76°
Eastern Limit for GSO	236°E
Western Limit for GSO	84°E

SOMALIA

Official name: Somali a (formerly Somali Democratic Republic)
Capital: Mogadishu
ITU country abbreviation: SOM
ITU Region: 1

International telephone dialing code: 252
International telex dialing code: 0900

Demographic and Physical Information

Area: 637,660 km²
Population: 7.35 million
Major languages: Somali (official), Arabic, Italian
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: NA
Television standard: NA
Electrical standard: 110 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Posts and Telecommunications
Mogadishu, Somalia
Telephone: 252 29005
Telex: 0900 754

Officials

Yusuf Ali Nour, Vice-Minister of Posts and Telcommunications; Said Aden Farah, Permanent Secretary; Omer Hussein Bin Hussein, Deputy Permanent Secretary; Ahmed Mohamed Aden, Director of Planning; Anthony Jerome Abdi, Senior Engineer

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat); investment share 0.24%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Posts and Telecommunications of the Somali Democratic Republic
Ownership: 0.050000%
Earth stations: NA

Range of Geostationary Satellites Visible

Location	Mogadishu
Lat.°	2N
Long.°	45.4E
°Long. Differ. Visible	76°
Eastern Limit for GSO	129°E
Western Limit for GSO	329°E (31°W)

SOUTH AFRICA

Official name: Republic of South Africa
Capital: Pretoria (administrative); Cape Town (legislative); Bloemfontein (judicial)
ITU country abbreviation: AFS
ITU Region: 1

International telephone dialing code: 27
International telex dialing code: 960

Demographic and Physical Information

Area: 1.22 million km²
Population: 45.1 million
Major languages: Afrikaans and English (both official)
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: <4.5 million
Submarine cable connections: 1
Radio stations: 14 AM, 286 FM

Television standard: PAL I
Electrical standard: 220 and 230 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: NA
Television sets: 4 million
TV households: 2.9 million
Cable penetration: none
VCR penetration: 27%
Satellite Earth stations: 2 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

The Postmaster General/International Services (3C3)
Private Bag X74
Pretoria 0001, South Africa
Telephone: +27 12 2932111
Fax: +27 12 3266492

Officials
J.H. de Villiers, Postmaster General

The Assistant General Manager
Quality of Telephone Accounts (3C32C)
Private Mail Bag
Pretoria 0001, South Africa
Telephone: +27 12 2931453
Fax: +27 12 3266492
Telex: 322889P gntl sa

The Assistant General
International Accounts (3C31D)
Private Mail Bag
Port Elizabeth 6000, South Africa
Telephone: +27 41 5031590
Fax: +27 41 553441
Telex: 243316p sa

Broadcasting Services

South African Broadcasting Corporation
Broadcasting Centre
Auckland Park 2006
Johannesburg, South Africa
Telephone: +27 11 714 9111
Fax: +27 11 714 5395/6064
Telex: +960 424116

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
(Note: membership suspended)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telkom SA Limited
Ownership: 1.144476%
Earth stations:
Mmabatho (AOR primary) — 335.5
Pretoria 1 (AOR primary) — 335.5
Pretoria 2 (IOR primary) — 60.0
Pretoria 3 (AOR major path) — 342.0

Range of Geostationary Satellites Visible

Location	Johannesburg
Lat.°	26.2S
Long.°	28E
° Long. Differ. Visible	75°
Eastern Limit for GSO	103°E
Western Limit for GSO	313°E (47°W)

■ SOUTH KOREA

see Korea, South

■ SOVIET UNION

see Russia

■ SPAIN

Official name: Kingdom of Spain
Capital: Madrid
ITU country abbreviation: E
ITU Region: 1

International telephone dialing code: 34
International telex dialing code: 052

Demographic and Physical Information

Area: 504,750 km²
Population: 39.4 million
Major languages: Spanish
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 15.35 million
Submarine cable connections: 22
Radio stations: 190 AM, 406 FM (134 repeaters)
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 3
Television stations: 100 (1,297 repeaters)
Television sets: NA
TV households: 12 million
Cable penetration: 10%
VCR penetration: 49%
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministerio de Obras Públicas y Transportes
Secretaria General de Comunicaciones
28070 Madrid, Spain
Telephone: 1 5216500
Fax: 1 5311051

Officials
Don José Borrell Fontelles, Ministro de Obras Públicas y Transporte; Elena Salgado, Mendez, Secretario General de Comunicaciones

Telecommunications Operator
Telefónica de España
Gran Via 28
E-28013 Madrid, Spain
Telephone: 1-531-8676
Fax: 1-531-1459

Officials
D. Cándido Veláquez-Gaztelu Ruiz, Presidente del Consejo de Administración; D. Enrique Used Aznar, Director General de Internacional

Telefónica de España
Departmento de Relacions International
C/Beatriz de Bobadilla 3 - planta°
28040 Madrid, Spain
Telephone: 1 5334000
Fax: 1 5347972
Telex: 052 46032 etm e

Galavision
Telecine SA
Arrastaria s/n Pol Las Mercedls
Ctra. Nacional II km 11.300
E-28022 Madrid, Spain
Telephone: 1-329-3917
Fax: 1-747-6463

Tele 5
Gestevision Telecino SA
Torte Picasso
Plaza Pablo Ruio Picasso
E-28020 Madrid, Spain
Telephone: 396-6100
Fax: 1-555-0044

TVE Internacional SA
Torrespaña, O'Donnell 77
E-28007 Madrid, Spain
Telephone: 1-346-8519
Fax: 1-346-9751

Broadcasting Services

Television Espanola - RTVE
Prado del Rey
Madrid 28023, Spain
Telephone: 1 346 4000
Fax: 1 711 4509
Telex: 052 27694

Antena 3 Television
Ctra. Madrid-Irun
San Sebastian de Los Reyes
Madrid 28700, Spain
Telephone: 1 6230829
Fax: 1 6230867

Canal + Spain
Gran Via 32, Tercera Planta
Madrid 28013, Spain
Telephone: 1 3965515 or 3965515
Fax: 1 3965600 or 3965844

Ente Púplico de Red Tecénica Española
de Televisión (RETEVISION)
Paseo de la Castellana, 83-85
28046 Madrid, Spain
Telephone: 1 5553300
Fax: 1 5565241
Telex: 052 22989

Sociedad Españona de Radiodifusión, S.A. (SER)
Gran Vía, 32
28013 Madrid, Spain
Telephone: 1 3470700
Fax: 1 3470709
Telex: 052 27638 ser e

Other Recognized Operators

HISPASAT, S.A.
C/Gobelas, 41-43
La Florida
28023 Madrid, Spain
Telephone: 1 2076040/1
Fax: 1 2076683

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 17.89538%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telefonica de España, S.A./ Ctne Madrid
Ownership: 2.442714%
Earth stations:
Aguimes (AOR major path 1) — 325.5
Buitrago 1 (AOR major path 1) — 325.5
Buitrago 2 (IOR primary) — 60.0
Buitrago 3 (AOR primary) — 335.5
Buitrago 5 (AOR major path 2) — 342.0

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: 1.84055%
Earth station: NA

Domestic Satellite Network

Operator: Hispasat S.A.
Telephone: 1 207-6040
Fax: 1 307-6683
Telex: 47911 hsate

Satellites:
Hispasat 1A & 1B 329° E (31° W)

Range of Geostationary Satellites Visible

Location	Madrid
Lat.°	40.4N
Long.°	3.7W
° Long. Differ. Visible	72°
Eastern Limit for GSO	68°E
Western Limit for GSO	284°E (76°W)

SRI LANKA

Official name: Democratic Socialist Republic of Sri Lanka
Capital: Colombo
ITU country abbreviation: CLN
ITU Region: 3

International telephone dialing code: 94
International telex dialing code: 954

Demographic and Physical Information

Area: 65,610 km²
Population: 18.4 million
Major languages: Sinhala (official); Tamil, English
Time zones: GMT + 5h30m

Telecommunications Statistics

Number of telephones: 114,000
Submarine cable connections: 2
Radio stations: 12 AM, 5 FM
Television standard: PAL B
Electrical standard: 230 vac, 50 Hz
State-run television networks: 2
Private television networks: none
Television stations: 5
Television sets: 500,000
TV households: NA
Cable penetration: NA
VCR penetration: 37%
Satellite Earth stations: 2 Intelsat IOR

Telecommunications Regulatory Organization

The Director General of Telecommunications
E.H. Cooray Building, 1st Floor, 411 Galle Road, Colombo 3, Sri Lanka
Telephone: +94 1 575003

Officials
A.M.S. Adikari, Minister of Posts and Telecommunications

Broadcasting Services

Sri Lanka Rupavahini Corporation - SLRC
P.O. Box 2204
Colombo, Sri Lanka
Telephone: +94 1 580131, 587722, or 501050/1/2/3/4/5
Fax: +94 1 580929
Telex: +954 22148

Independent Television Network - ITN
Wickramasinghepura, Battaramulla
P.O. Box 574
Colombo 7, Sri Lanka
Telephone: +94 1 564591 or 565491
Telex: +954 22445

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Sri Lanka/ OTS Colombo
Ownership: 0.050000%
Earth stations:
Padukka (IOR primary) — 60.0
Trincomalee (IOR primary) — 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Government of Sri Lanka
Ownership: NA
Earth station: none

Range of Geostationary Satellites Visible

Location	Colombo
Lat.°	6.9N
Long.°	80E
° Long. Differ. Visible	76°
Eastern Limit for GSO	156°E
Western Limit for GSO	4°E

SUDAN

Official name: Republic of the Sudan
Capital: Khartoum
ITU country abbreviation: SDN
ITU Region: 1

International telephone dialing code: 249
International telex dialing code: 970

Demographic and Physical Information

Area: 2.51 million km²
Population: 30.12 million
Major languages: Arabic (official), Nubian
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 11 AM
Television standard: PAL B
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 3
Television sets: NA
TV households: NA

Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Arabsat

Telecommunications Regulatory Organization

Sudan Telecommunications Public Corporation (STPC)
Khartoum, Sudan
Telephone: 11 72168
Fax: 11 75599

Officials

P.S.C. Salah El Din Mohamed Ahmed Karrar, Minister of Transport, Communications; Mustafa Ibrahiem Mohamed, Director-General, STPC

Broadcasting Services

Sudan Television
P.O. Box 1094
Omdurman, Sudan
Telephone: 11 53519
Telex: 0984 22669

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat); investment share 0.27%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Democratic Republic of Sudan
Ownership: 0.119662%
Earth stations:
Umm Haraz 1 (AOR primary) — 335.5
Umm Haraz 2 (AOR primary) — 335.5

Range of Geostationary Satellites Visible

Location	Khartoum
Lat.°	15.5N
Long.°	32.6E
°Long. Differ. Visible	76°
Eastern Limit for GSO	109°E
Western Limit for GSO	317°E (47°W)

SUMATRA (INDONESIA)

Range of Geostationary Satellites Visible

Location	Sumatra
Lat.°	0.7N
Long.°	100.3E
°Long. Differ. Visible	77°
Eastern Limit for GSO	177°E
Western Limit for GSO	23°E

SURINAME

Official name: Republic of Suriname
Capital: Paramaribo
ITU country abbreviation: SUR
ITU Region:

International telephone dialing code: 597
International telex dialing code: 397

Demographic and Physical Information

Area: 163,270 km²
Population: 429,544
Major languages: Dutch (official); English, Surinamese
Time zones: GMT - 3h

Telecommunications Statistics

Number of telephones: 27,500
Submarine cable connections: none
Radio stations: 5 AM, 14 FM, 1 shortwave
Television standard: NTSC M
Electrical standard: 127 vac, 60 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 6
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Telecommunicatiebedrijf Suriname (Telesur)
Heiligenweg, 1
P.O. Box 1839
Paramaribo, Suriname
Telephone: +597 473944
Fax: +597 477800

Officials

Johan R. Neede, Director, Telsur; Leo A. Boldewijn, Coordinator of Operations, Telsur

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Paramarbo
Lat.°	5.8N
Long.°	55.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	21°E
Western Limit for GSO	229°E (131°W)

SWAZILAND

Official name: Kingdom of Swaziland
Capital: Mbabane (administrative); Lobamba (legislative)
ITU country abbreviation: SWZ
ITU Region: 1

International telephone dialing code: 268
International telex dialing code: 993

Demographic and Physical Information

Area: 17,360 km²
Population: 966,977
Major languages: Swazi (official); English
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 17,000
Submarine cable connections: none
Radio stations: 7 AM, 6 FM
Television standard: PAL
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 10
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Posts and Telecommunication Corporation
P.O. Box 125, Mbabane, Swaziland
Telephone: +268 32341

Officials

Wilson F. C. Mkhonza, Minister of Works and Communications; John Sikhondze, Managing Director, Posts and Telecommunications; Nicholas R. Manana, Deputy Managing Director, Posts and Telecomms; Alfred S. Diamini, Director of Telecommunications

Broadcasting Services

Swaziland Broadcasting Service
P.O. Box 1
146 Mbabane, Swaziland
Telephone: +268 43036
Telex: +993 2035

Swaziland Television and Broadcasting Corp.
Swazi Plaza
P.O. Box 146
Mbabane, Swaziland
Telephone: +268 42761
Telex: 2035 wd

International Telecommunications Organization Membership

International Telecommunication Union (ITU)
International Telecommunications Satellite Organization (Intelsat)
Signatory: Posts and Telecommunications Corporation (Public)/ Sptd Mbabane
Ownership: 0.050000%
Earth stations: Ezulwini (AOR major path 2) — 342.0

Range of Geostationary Satellites Visible

Location	Mbabane
Lat.°	26.3S
Long.°	31.1E
°Long. Differ. Visible	75°
Eastern Limit for GSO	106°E
Western Limit for GSO	316°E (44°W)

SWEDEN

Official name: Kingdom of Sweden
Capital: Stockholm
ITU country abbreviation: S
ITU Region: 1

International telephone dialing code: 46
International telex dialing code:054

Demographic and Physical Information

Area: 449,964 km²
Population: 8.82 million
Major languages: Swedish
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 8.2 million
Submarine cable connections: 5
Radio stations: 5 AM, 360 FM (mostly repeaters)
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 2
Television stations: 880 (mostly repeaters)
Television sets: 3.5 million
TV households: 3.3 million
Cable penetration: 30%
VCR penetration: 76%
Satellite Earth stations: 1 Intelsat AOR, 1 Eutelsat

Telecommunications Regulatory Organization

Swedish Telecom Headquarters
S-12386 Farsta, Sweden
Telephone: 8 7131000
Fax: 8 7133333

Officials
Tony Hagstrom, Director-General of Telecommunications

Broadcasting Services

Sveriges Television - SVT
Oxenstiernsgatan 26-34
S-105 10 Stockholm, Sweden
Telephone: 8 7846000 or 7847400
Fax: 8 7841500

TV 4 Nordisk Television AB
Storangskroken 10
115 79 Stockholm, Sweden
Telephone: 8 6444400
Fax: 8 6444440

Sveriges Radio
(Swedish Broadcasting Corporation)
S - 10610 Stockholm, Sweden
Telephone: 8 7840000
Fax: 8 7841500
Telex: 10000 srcent s

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 2.90749%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Swedish Telecom
Ownership: 0.643207%
Earth stations:
Tanum 1 (AOR major path 1) — 325.5
Tanum 2 (AOR primary) — 335.5

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: 0.78112%
Earth station: NA

Domestic Satellite Network
(Can also provide service to other Nordic countries)
Operator: Swedish Space Corporation
Telephone: 8-627200
Fax: 8-987-060
Satellite: Tele-X (5°W/355°E)

Range of Geostationary Satellites Visible

Location	Stockholm
Lat.°	59.3N
Long.°	18E
°Long. Differ. Visible	63°
Eastern Limit for GSO	81°E
Western Limit for GSO	315°E (45°W)

SWITZERLAND

Official name: Swiss Confederation
Capital: Bern
ITU country abbreviation: SUI
ITU Region: 1

International telephone dialing code: 41
International telex dialing code: 045

Demographic and Physical Information

Area: 41,290 km²
Population: 7.09 million
Major languages: German, French, Italian
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 5.89 million
Submarine cable connections: none
Radio stations: 7 AM, 265 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 4
Television stations: 18 (1,322 repeaters)
Television sets: NA
TV households: 2.4 million
Cable penetration: 75%
VCR penetration: 50%
Satellite Earth stations: 2 Intelsat AOR and IOR

Telecommunications Regulatory Organization

L'Enterprise des Postes, Telephones et Telegraphs
CH-3030 Berne, Switzerland
Telephone: 31 621111
Fax: (2/m) 31 622549

Officials
Dieter Max Syz, President, General Directorate, PTT

Broadcasting Services

Swiss Broadcasting Corporation - SRG SSR
1 Giacomettistrasse
CH-3000 Berne 15, Switzerland
Telephone: 31 439111
Fax: 31 625624
Telex: +8045 911590

Schweizer Fernsehen - DRS
Fernsehstrasse 1-4
Postfach 8052
Zurich, Switzerland
Telephone: 1 3056611
Fax: 1 3055660
Telex: +845 823823

Radiotelevisione Della Svizzera Italiana - RTSI
P.O. Box
CH - 6903 RTSI lugano, Switzerland
Telephone: 91 585111
Fax: 91 585355
Telex: +845 844484

Television Suisse Romande - TSR
20 quai Ernest Ansermet
CH-1211 Geneva 8, Switzerland
Telephone: 22 7089911
Fax: 22 7811908
Telex: +845 427701

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 1.46558%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Direction Generale de l'Enterprise des Postes, Telephones, et Telegraphes Suisses
Ownership: 1.091446%
Earth stations:
Leuk 1 (AOR major path 1) — 325.5
Leuk 2 (AOR primary) — 335.5
Leuk 3 (IOR primary) — 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: 0.54065%
Earth station: NA

Range of Geostationary Satellites Visible

Location	Bern
Lat.°	46.7N
Long.°	7.7E
° Long. Differ. Visible	70°
Eastern Limit for GSO	78°E
Western Limit for GSO	298°E (62°W)

SYRIA

Official name: Syrian Arab Republic
Capital: Damascus
ITU country abbreviation: SYR
ITU Region: 1

International telephone dialing code: 963
International telex dialing code: 0492

Demographic and Physical Information
Area: 185,180 km²
Population: 15.45 million
Major languages: Arabic (official); Kurdish, Armenian
Time zones: GMT + 2h

Telecommunications Statistics
Number of telephones: 512,600
Submarine cable connections: 1
Radio stations: 9 AM, 1 FM
Television standard: SECAM
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 17
Television sets: NA
TV households: 700,000
Cable penetration: none
VCR penetration: 41%
Satellite Earth stations: 1 Intelsat IOR, 1 Intersputnik

Telecommunications Regulatory Organization
Syrian Telecommunications Establishment
Saadallah Jabiri Street
Damascus, Syria
Telephone: 11 240300
Fax: 11 242000
Telex: 0492 411015

Officials
Murad Al-Kuwatly, Minister of Communications; Makram Obeid, Director-General, Syrian Telecommunications Est.

Broadcasting Services
Syrian Arab Television
Directorate General of Broadcasting & TV
Ommayades Square, Damascus
Telephone: 11 720200
Telex: 0492 411 2233

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat)
Signatory: NA
Ownership: NA

International Telecommunication Union (ITU)

International Organization of Space Communications (Intersputnik)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Syrian Arab Republic
Ownership: 0.086840%
Earth stations:
Sednaya (IOR primary) — 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: NA
Ownership: NA
Earth station: NA

Range of Geostationary Satellites Visible

Location	Damascus
Lat.°	33.5N
Long.°	36.3E
° Long. Differ. Visible	74°
Eastern Limit for GSO	110°E
Western Limit for GSO	322°E (38°W)

TAHITI (FRANCE)

see French Polynesia

Range of Geostationary Satellites Visible

Location	Papeete
Lat.°	17.6S
Long.°	149.5W
° Long. Differ. Visible	76°
Eastern Limit for GSO	286°E (74°W)
Western Limit for GSO	134°E

TAIWAN

Official name: Taiwan
Capital: Taipei
ITU country abbreviation: none
ITU Region: 3

International telephone dialing code: 886
International telex dialing code: 785

Demographic and Physical Information
Area: 35,980 km²
Population: 21.51 million
Major languages: Mandarin Chinese (official); Taiwanese
Time zones: GMT + 8h

Telecommunications Statistics
Number of telephones: 7.80 million
Submarine cable connections: 9
Radio stations: 91 AM, 23 FM
Television standard: NTSC
Electrical standard: 110 vac, 60 Hz
State-run television networks: 3
Private television networks: none
Television stations: 15 (13 repeaters)
Television sets: 6.386 million
TV households: 4.8 million
Cable penetration: NA
VCR penetration: 65%
Satellite Earth stations: 1 Intelsat IOR, 1 Intelsat POR

Telecommunications Regulatory Organization

Taiwan Television Enterprise - Channel 7
10, Pa Te Road
Section 3
Taipei 105, Taiwan
Telephone: +886 2 7725105
Fax: +886 2 7731335 or 7759634
Telex: +785 25714

Chinese Television System - Channel 9
100 Kuang Fu South Road
Taipei 10552, Taiwan
Telephone: +886 2 7510321
Fax: +886 2 7775414
Telex: +785 24159

China Television Company - Channel 11
53, 3rd Section
Jen Ai Road
Taipei, Taiwan
Telephone: +886 2 7838308
Fax: +886 2 7828776 or 7833069
Telex: +785 25080

China Public Television
5, Ching Tao E. Road
Taipei, Taiwan
Telephone: +886 2 2311350 or 3911397
Telex: +785 11636

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunication Satellite Organization (Intelsat)
Signatory: COMSAT FOR ITA
Ownership: NA
Earth stations:
Tapei 2 (POR primary) — 174.0
Tapei 3 (IOR primary) — 60.0

Range of Geostationary Satellites Visible

Location	Taipei
Lat.°	25.1N
Long.°	121.5E
°Long. Differ. Visible	75°
Eastern Limit for GSO	196°E
Western Limit for GSO	47°E

■ TAJIKSTAN

Official name: Republic of Tajikistan
Capital: Dushanbe
ITU country abbreviation: TJK
ITU Region: 1

International telephone dialing code: 7
International telex dialing code: 0787

Demographic and Physical Information

Area: 143,100 km²
Population: 6.16 million
Major languages: Tajik (official)
Time zones: GMT + 5h

Telecommunications Statistics

Number of telephones: 303,000
Submarine cable connections: none
Radio stations: NA
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 2 Intelsat (TV receive only), 1 Orbita

Telecommunications Regulatory Organization

Ministry of Telecommunications
Rudaki Prospekt 57
734025 Dushanbe, Tajikstran

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Dushanbe
Lat.°	38.5N
Long.°	68.8E
°Long. Differ. Visible	73°
Eastern Limit for GSO	141°E
Western Limit for GSO	356°E (4°W)

■ TANZANIA

Official name: United Republic of Tanzania
Capital: Dar es Salaam
ITU country abbreviation: TZA
ITU Region: 1

International telephone dialing code: 255
International telex dialing code: 975

Demographic and Physical Information

Area: 945,090 km²
Population: 28.7 million
Major languages: Swahili and English (both official)
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 103,800
Submarine cable connections: none
Radio stations: 12 AM, 4 FM
Television standard: VHF: PAL B, PAL I; UHF: PAL I
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 2
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat IOR, 1 Intelsat AOR

Telecommunications Regulatory Organization

Tanzania Posts and Telecommunications (TP&T)
P.O. Box 9070, Samora Avenue
Dar-es-Salaam, Tanzania
Telephone: +255 52 31155
Fax: +255 51 34610

Officials

F.C. Kasambala, Director-General, TP&T: A. B. Mapunda, Deputy Director-General, TP&T; S. B.J.Ngalambe, Director, Telecommunications; A. H.J. Marijani, Director, Telecommunications Operations

Broadcasting Services

Televison Zanzibar
P.O. Box 314
Zanzibar, Tanzania
Telephone: +255 54 32816
Telex: +975 57200

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Tanzanian Posts and Telecommunications Corporation
Ownership: 0.064473%
Earth stations:
Mwenge 1 (IOR primary) — 60.0

Range of Geostationary Satellites Visible

Location	Dares Salaam
Lat.°	6.8S
Long.°	39.2E
°Long. Differ. Visible	76°
Eastern Limit for GSO	116°E
Western Limit for GSO	323°E (37°W)

THAILAND

Official name: Kingdom of Thailand
Capital: Bangkok
ITU country abbreviation: THA
ITU Region: 3

International telephone dialing code: 66
International telex dialing code: 788

Demographic and Physical Information

Area: 514,000 km²
Population: 60.2 million
Major languages: Thai, English
Time zones: GMT + 7h

Telecommunications Statistics

Number of telephones: 739,500
Submarine cable connections: NA
Radio stations: 200 AM, 100 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 5
Private television networks: 2
Television stations: 11
Television sets: 6.8 million
TV households: NA
Cable penetration: 1%
VCR penetration: 13%
Satellite Earth stations: 1 Intelsat IOR, 1 Intelsat POR

Telecommunications Regulatory Organization

Post and Telegraph Department
SoiSailom, Phaholyothin Road
Bangkok 10400, Thailand
Telephone: +66 2 2713508
Fax: +66 2 2713514

Officials

Nukul Prachabmoh, Minister of Transport and Communications; Smith Tumsaroch, Director-General of Post and Telegraph Department, Executive; Somchit Chularat, Director of International Services; Sethaporn Cusripituck, Deputy Director-General, Technical

Broadcasting Services

Bangkok Entertainment Co., LTD - Thai TV Color - Channel 3
Vanit Building
1126/1 New Petchburi Road
Bangkok 101400, Thailand
Telephone: +66 2 2539970
Fax: +66 2 2539978
Telex: +788 82616

Bangkok Broadcasting & TV - BBTV - Channel 7
998/1 Phaholyothin Road
Bangkhen
Bangkok 10900, Thailand
Telephone: +66 2 2781255 - 60
Fax: +66 2 2711532
Telex: +788 82730

Television of Thailand - Channel 11
New Petchburi Road
Huay-Kwang
Bangkok 10310, Thailand
Telephone: +66 2 31821100
Fax: +66 2 3182991
Telex: +788 72171

Thai Television - Channel 9 - (MCOT)
222 Rama IX Road
Bangkok 10310, Thailand
Telephone: +66 2 2450700-19
Fax: +66 2 2451649
Telex: +788 84577

International Broadcasting Corporation Limited
1376/1 Nakornchaisri
Dusit, Bangkok 10310, Thailand
Telephone: + 66 2 2435300
Fax: +66 2 2435987
Telex: +788 72195

Other Recognized Operators

The Communications Authority of Thailand (CAT)
Bangkok 10002, Thailand
Telephone: +66 2 5735410
Fax: +66 2 5735413
Telex: 80006 cat th or 80023 cat th

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Thailand
Ownership: 0.999491%
Earth stations:
Si Racha 1 (IOR primary) — 60.0
Si Racha 2 (POR primary) — 174.0

Range of Geostationary Satellites Visible

Location	Bangkok
Lat.°	13.7N
Long.°	100.6E
°Long. Differ. Visible	76°
Eastern Limit for GSO	177°E
Western Limit for GSO	25°E

TOBAGO

see Trinidad and Tobago

Range of Geostationary Satellites Visible

Location	Tobago
Lat.°	11.2N
Long.°	60.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	15°E
Western Limit for GSO	223°E (137°W)

TOGO

Official name: Republic of Togo
Capital: Lomé
ITU country abbreviation: TGO
ITU Region: 1

International telephone dialing code: 228
International telex dialing code: 986

Demographic and Physical Information

Area: 56,790 km²
Population: 4.41 million
Major languages: French
Time zones: GMT

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 2 AM
Television standard: SECAM K1
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 3 (2 relays)
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

L'Office des Postes et Communications du Togo (OPCT)
Avenue Nocolas Grunitzy
Boîte Postale 333
Lome, Togo
Telephone: +228 214401
Fax: +228 21-0370

Officials

M. Kossivi Ayikoe, Director, Telecommunications; M. Tchamdja Andjo, Director-General, (OPCT)

Broadcasting Services
Television Togolaise
P.O. Box 3286
Lome, Togo
Telephone: +228 215357
Fax: +228 215786

Other Recognized Operators
Société autonome des télécommunications international du Togo
Lome, Togo
Telephone: +228 210620
Fax: +228 3309
Telex: 5372 tg

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Office des Postes et Telecommunications du Togo (OPTT)
Ownership: 0.149696%
Earth stations:
Cascavelli (AOR primary) — 335.5

Range of Geostationary Satellites Visible

Location	Lome
Lat.°	6.1N
Long.°	1.3W
°Long. Differ. Visible	76°
Eastern Limit for GSO	78°E
Western Limit for GSO	285°E (75°W)

TOKELAU (NEW ZEALAND)

Status: territory of New Zealand
ITU abbreviation: TKL
ITU Region: 3

International telephone dialing code: 960
International telex dialing code: NA

Demographic and Physical Information
Area: 10 km²
Population: 1,503
Major languages: Tokelauan, English
Time zones: GMT - 11h

Telecommunications Statistics
Number of telephones: NA
Submarine cable connections: NA
Radio stations: NA
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: none

Telecommunications Regulatory Organization
Secretary for Tolelau Affairs
P.O. Box 865
Apia, Tokelau
Telephone: +20822

Range of Geostationary Satellites Visible

Location	Tokelau
Lat.°	9S
Long.°	171.7E
°Long. Differ. Visible	76°
Eastern Limit for GSO	248°E
Western Limit for GSO	96°E

TONGA

Official name: Kingdom of Tonga
Capital: Nuku'alofa
ITU country abbreviation: TON
ITU Region: 3

International telephone dialing code: 676
International telex dialing code: NA

Demographic and Physical Information
Area: 748 km²
Population: 105,600
Major languages: Tongan, English
Time zones: GMT +12h

Telecommunications Statistics
Number of telephones: 3,529
Submarine cable connections: NA
Radio stations: 1 AM
Television standard: none
Electrical standard: 240 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization
Tonga Telecommunication Commission (TTC)
P.O. Box 46
Nuku'Alofa, Tonga
Telephone: +676 24255
Fax: +676 22200

Officials
Lemeki Malu, General Manager, TTC

Broadcasting Services
Tonga Broadcasting Commission
P.O. Box 36
Nuku' Alofa, Tonga
Telephone: +676 21555

Other Recognized Operators
Cable and Wireless Plc.
Private Mail Bag No. 4
Nuku'Alofa, Tonga
Telephone: +676 23499
Fax: +676 22970
Telex: 0777 66222

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Nuku'alofa
Lat.°	21.2S
Long.°	174E
°Long. Differ. Visible	76°
Eastern Limit for GSO	250°E
Western Limit for GSO	98°E

TORTOLA (UNITED KINGDOM)

see British Virgin Islands

Range of Geostationary Satellites Visible

Location	Tortola
Lat.°	18.3N
Long.°	64.8W
°Long. Differ. Visible	76°
Eastern Limit for GSO	11°E
Western Limit for GSO	220°E (140°W)

TRINIDAD AND TOBAGO

Official name: Republic of Trinidad and Tobago
Capital: Port-of-Spain
ITU country abbreviation: TRD
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: 387

Demographic and Physical Information

Area: 5,130 km²
Population: 1.27 million
Major languages: English (official); Hindi, French, Spanish
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 109,000
Submarine cable connections: NA
Radio stations: 2 AM, 4 FM
Television standard: NTSC M
Electrical standard: 115 and 230 vac, 60 Hz
State-run television networks: 1
Private television networks: none
Television stations: 5
Television sets: NA
TV households: 300,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Office of the Prime Minister
Telecommunications Division
17A Abercromby Street
Port of Spain, Trinidad and Tobago
Telephone: +1 809 6272051
Fax: +1 809 6243869

Officials

Raymond Robinson, Prime Minister; R. Winston Ragbir, Director, Telecommunications Division

Broadcasting Services

Trinidad and Tobago Television - TTT
11 A Maraval Road
P.O. Box 665
Port of Spain, Trinidad and Tobago
Telephone: +1(809) 6224141
Fax: +1(809) 6220344
Telex: +387 22664

AVM Television Channel 4
Lady Young Road
Morvant, Trinidad and Tobago
Telephone: +1(809) 6741307/1333/0393
Fax: +1(809) 6383883

National Broadcasting Service
17 Abercromby Street
Port of Spain, Trinidad and Tobago
Telephone: +1(809) 21151
Telex: 22222 wg

Radio Trinidad
11b, Marval Road
Port of Spain, Trinidad and Tobago
Telephone: +1(809) 6224141
Telex: 22664 tttv wg

Other Recognized Operators

Telecommunication Services of Trinidad and Tobago Ltd. (TSTT)
P.O. Box 917 54, Fredrick Street
Port of Spain, Trinidad and Tobago
Telephone: +1(809) 6234122
Fax: +1(809) 6254585
Telex: 22392 Combo wg

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Trinidad and Tobago External Communications Company Ltd. (Textel Trinidad)
Ownership: 0.050000%
Earth stations:
Matura Point (AOR major path 1) — 325.5

Range of Geostationary Satellites Visible

Location	Port-of-Spain
Lat.°	10.7N
Long.°	61.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	14°E
Western Limit for GSO	222°E (138°W)

■ TRISTANDA CUNHA (UNITED KINGDOM)

see St. Helena

Range of Geostationary Satellites Visible

Location	Tristan
Lat.°	37.1S
Long.°	12.3W
°Long. Differ. Visible	73°
Eastern Limit for GSO	61°E
Western Limit for GSO	275°E (75°W)

■ TUNISIA

Official name: Republic of Tunisia
Capital: Tunis
ITU country abbreviation: TUN
ITU Region: 1

International telephone dialing code: 216
International telex dialing code: 0409

Demographic and Physical Information

Area: 163,610 km²
Population: 8.88 million
Major languages: Arabic (official), French
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 233,000
Submarine cable connections: 5
Radio stations: 7 AM, 8 FM
Television standard: VHF: SECAM B, PAL; UHF: SECAM G, PAL
Electrical standard: 127 and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 19
Television sets: NA
TV households: 1.5 million
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Arabsat

Telecommunications Regulatory Organization

Ministere des Communications
3 bis, rue d' Angleterre
Tunis, Tunisia
Telephone: 1 245136
Fax: 1 352353

Officials

Habib Lazreg, Minister of Communications

Telecommunications Operator

Direction générale des télécommunications
Bd. du 9 avril
La Kasbah
Tunis, Tunisia
Telephone: 1 261933
Fax: 1 564357
Telex: 0409 Gentel 15350 tn

Officials

Moncef Toumi, Director Générale des Télécommunications

Broadcasting Services

Radiodiffusion Television Tunisienne -
RTT - Channel 3
71 Ave de la Liberte
Tunis Belvedere, Tunsinia
Telephone: 1 287300
Fax: 1 781058
Telex: 0409 14960

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat); investment share 0.74%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Administration for Post, Telegraph and Telephone of Tunisia
Ownership: 0.050000%
Earth stations:
Dkhila (AOR primary) — 335.5

International Maritime Satellite Organization (Inmarsat); investment share 0.06045%

Range of Geostationary Satellites Visible

Location	Tunis
Lat.°	36.8N
Long.°	10.2E
°Long. Differ. Visible	73°
Eastern Limit for GSO	83°E
Western Limit for GSO	297°E (63°W)

■ TURKEY

Official name: Republic of Turkey
Capital: Ankara
ITU country abbreviation: TUR
ITU Region: 1

International telephone dialing code: 90
International telex dialing code: 821

Demographic and Physical Information

Area: 780,580 km²
Population: 63.4 million
Major languages: Turkish (official); Kurdish, Arabic
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 3.4 million
Submarine cable connections: 1
Radio stations: 15 AM, 94 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 1
Television stations: 357
Television sets: NA
TV households: 12.5 million
Cable penetration: 3%
VCR penetration: 40%
Satellite Earth stations: 2 Intelsat AOR, 1 Eutelsat

Telecommunications Regulatory Organization

Directorate General of PTT
Ankara, Turkey
Telephone: 4 3125252
Fax 4 3126935

Officials
Emin Baser, Director-General, Posts, Telegraphs and Telephones

Broadcasting Services

Turkish Radio and Television Corporation
TRT Sitesi Oran Yolu
06450 Conkaya-Ankara, Turkey
Telephone: 4 4250152
Fax: 4 44901733
Telex: 0607 42767

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment 3.45928%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Turkey
Ownership: 0.399796%
Earth stations:
Ankara 1 (AOR primary) — 335.5
Ankara 3 (IOR primary) — 60.0

International Maritime Satellite Organization (Inmarsat)
Signatory: General Directorate of the PTT
Ownership: 0.094%
Earth station:
Ata (AORE)
Ata (IOR)

Range of Geostationary Satellites Visible

Location	Ankara
Lat.°	39.9N
Long.°	32.9E
°Long. Differ. Visible	72°
Eastern Limit for GSO	105°E
Western Limit for GSO	321°E (339°W)

■ TURKMENISTAN

Official name: Turkmenistan
Capital: Ashgabat (Ashkhbad)
ITU country abbreviation: TKM
ITU Region: 1

International telephone dialing code: 7
International telex dialing code: 789

Demographic and Physical Information

Area: 488,100 km²
Population: 4.08 million
Major languages: Turkmen, Russian
Time zones: GMT + 5h

Telecommunications Statistics

Number of telephones: 7.5 per 100
Submarine cable connections: none
Radio stations: NA
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Orbita, 1 Intelsat (TV receive only)

Telecommunications Regulatory Organization

Ministry of Communications
Zhitnikova St. 36
Ashgabat, Turkmenistan
Telephone: +7 3632 252153
Fax: +7 3632 290 420
Telex: 064 228129 pth su

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Ashkhabad
Lat.°	38N
Long.°	57.8E
°Long. Differ. Visible	73°
Eastern Limit for GSO	131°E
Western Limit for GSO	345°E (15°W)

■ TURKS AND CAICOS ISLANDS (UNITED KINGDOM)

Capital: Grand Turk (Cockburn Town)
Status: dependent territory of the United Kingdom
ITU abbreviation: TCA
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: NA

Demographic and Physical Information

Area: 430 km²
Population: 13,941
Major languages: English (official)
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 1,446
Submarine cable connections: 2
Radio stations: 3 AM
Television standard: PAL
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

The Postmaster
General Post Office
Grand Turk, Turks and Caicoes Islands
Telex: 8227 Chief min tq

Other Recognized Operators

Cable and Wireless (W.I.) Ltd.
Queen Street
P.O. Box 78
Grand Turk, Turks and Ciacos Islands
Telephone: +1(809) 9462222
Telex: 8210 cwtkopr tq

Range of Geostationary Satellites Visible

Location	Grand Turk
Lat.°	21.3N
Long.°	71.3W
°Long. Differ. Visible	75°
Eastern Limit for GSO	4°E
Western Limit for GSO	213°E (147°W)

TUVALU

Official name: Tuvalu
Capital: Funafuti
ITU country abbreviation: TUV
ITU Region: 3

International telephone dialing code: 688
International telex dialing code: NA

Demographic and Physical Information

Area: 26 km²
Population: 9,991
Major languages: Tuvaluan, English
Time zones: GMT +12h

Telecommunications Statistics

Number of telephones: 108 (300 radiotelephones)
Submarine cable connections: NA
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: none

Telecommunications Regulatory Organization

Department of Communications
Funafuti, Tuvalu
Telephone: +688 806
Fax: (3+2) +688 800
Telex: (774) 18105 vkues

Officials
Mr. Metia Tealoft, Minister of Communications

International Telecommunications Organization Membership

none

Range of Geostationary Satellites Visible

Location	Funafuti
Lat.°	8.5S
Long.°	179E
°Long. Differ. Visible	76°
Eastern Limit for GSO	255°E
Western Limit for GSO	103°E

UGANDA

Official name: Republic of Uganda
Capital: Kampala
ITU country abbreviation: UGA
ITU Region: 1

International telephone dialing code: 256
International telex dialing code: 973

Demographic and Physical Information

Area: 236,040 km²
Population: 19.57 million
Major languages: English (official); Luganda, Swahili
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: none
Radio stations: 10 AM
Television standard: PAL
Electrical standard: 240 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 9
Television sets: NA
TV households: 100,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministry of Transport and Communications
P.O. Box 7270, Kampala, Uganda
Telephone: +256 41 230070

Officials
Ruhakana Rugunda, Minister of Transport and Communications

Broadcasting Services

Uganda Television
P.O.Box 4260
Kampala, Uganda
Telephone: +256 41 54461
Telex: +973 61084

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Power, Post and Telecommunications of the Government of the Republic of Uganda
Ownership: 0.064038%
Earth stations: Mpoma (AOR primary) — 335.5

Range of Geostationary Satellites Visible

Location	Kampala
Lat.°	0.3N
Long.°	32.5E
°Long. Differ. Visible	77°
Eastern Limit for GSO	109°E
Western Limit for GSO	315°E (45°W)

UKRAINE

Official name: Ukraine
Capital: Kiev (Kyyiv)
ITU country abbreviation: UKR
ITU Region: 1

International telephone dialing code: 7
International telex dialing code: 0680

Demographic and Physical Information

Area: 603,700 km²
Population: 51.87 million
Major languages: Ukranian, Russian, Romanian, Polish, Hungarian
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 7.89 million
Submarine cable connections: none
Radio stations: NA
Television standard: NA
Electrical standard: NA

State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: Intelsat, Inmarsat, Intersputnik

Telecommunications Regulatory Organization

State Committee for Communications
22, Kreshtchatik, 252001 Kiev, Ukraine

Officials
V.I. Delikatnyi, Chairman

Broadcasting Services

Concern of Broadcasataing, Radiocommunications and Television
10, Dorogozhitska
252112 Kiev, Ukraine
Telephone: 044-440842
Fax: 044-940722

Official
Vasilij M. Druzinskji

Ukraine State Teleradio Company
26 Kreschchatik
252001 Kiev 01, Ukraine
Telephone: 044 2263144
Fax: 044 2291170

International Telecommunications Organization Membership

International MaritimeSatellite Organization (Inmarsat)

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Kiev
Lat.°	50.5N
Long.°	30.5E
°Long. Differ. Visible	68°
Eastern Limit for GSO	99°E
Western Limit for GSO	323°E (37°W)

UNITED ARAB EMIRATES

Official name: United Arab Emirates
Capital: Abu Dhabi
ITU country abbreviation: UAE
ITU Region: 1

International telephone dialing code: 971
International telex dialing code: 0893

Demographic and Physical Information

Area: 75,581 km²
Population: 2.92 million
Major languages: Arabic (official), Persian, English, Hindi, Urdu
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 386,600
Submarine cable connections: 4
Radio stations: 8 AM, 3 FM
Television standard: PAL
Electrical standard: 220 and 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 12
Television sets: NA
TV households: 150,000
Cable penetration: none
VCR penetration: 63%
Satellite Earth stations: 1 Intelsat AOR, 2 Intelsat IOR, 1 Arabsat

Telecommunications Regulatory Organization

Ministry of Communications
P.O. Box 900, Abu Dhabi, United Arab Emirates
Telephone: 2 651900
Telex: 0893 22668

Officials
Mohammed Saeed Ai-Mulla, Minister of Communications; Halim Fanous, Director of Telecommunications

Broadcasting Services

United Arab Emirates Television Service
Airport Road
Abu Dhabi, United Arab Emirates
Telephone: 2 452000 or 4612400
Fax: 4 378336
Telex: +958 22557

UAE Radio and Television Dubai
P.O. Box 1695
Dhabi, United Arab Emirates
Telephone: 4 470255 or 370255
Fax: 4 378336
Telex: +958 45605

Telecommunications Operator

The Emirates Telecommunications Corp. Ltd.
Head Office
P.O. Box 3838
Abu Dhabi, United Arab Emirates
Telephone: 2 283333
Fax: 2 317000

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat)
Signatory: NA
Ownership: 4.66%
Earth stations: NA

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Ministry of Communications of the Government of the United Arab Emirates
Ownership: 1.130136%
Earth stations:
Abu Dhabi (AOR major path) — 342.0
Dubai (IOR primary) — 60.0
Ras al Khaimah (IOR major path) — 63.0
International Maritime Satellite Organization (Inmarsat)
Signatory: Ministry of Communications of the Government of the United Arab Emirates
Ownership: 0.44119%
Earth station: none

Range of Geostationary Satellites Visible

Location	Abu Dhabi
Lat.°	24.5N
Long.°	52.4E
°Long. Differ. Visible	75°
Eastern Limit for GSO	128°E
Western Limit for GSO	338°E (22°W)

UNITED KINGDOM

Official name: United Kingdom of Great Britain and Northern Ireland
Capital: London
ITU country abbreviation: G
ITU Region: 1

International telephone dialing code: 44
International telex dialing code: 051

Demographic and Physical Information

Area: 244,820 km²
Population: 58.3 million
Major languages: English, Welsh
Time zones: GMT

Telecommunications Statistics

Number of telephones: 30.2 million
Submarine cable connections: 40
Radio stations: 225 AM, 525 FM (mostly repeaters)
Television standard: PAL I
Electrical standard: 220, 230, and 240 vac, 50 Hz
State-run television networks: 1

Private television networks: 2
Television stations: 207 (3,210 repeaters)
Television sets: 20 million
TV households: NA
Cable penetration: 2%
VCR penetration: 66%
Satellite Earth stations: 7 Intelsat AOR, 3 Intelsat IOR, 1 Inmarsat, 1 Eutelsat

Telecommunications Regulatory Organization

Department of Trade and Industry
Telecommunications and Posts Division
151 Buckingham Road
2nd Floor
London, SW1W 9SS, United Kingdom
Telephone: 71 2155000
Fax: 71 2158073

Officials

P. Salvidge, Under Secretary, Telecommunications Division; J. Phillips, Head International Telcommunications; S. R. Temple, Head Telecommunications Technical Affairs Branch; P. J. Smith, Head, National Telecommunications and Films Branch

Telecommunications Operators

British Telecommunications Public Limited Co. (BT plc)
British Telecom Center
81 Newgate Street
London ECIA 7AJ, United Kingdom
Telephone: 71 3565000
Fax: 71 3565520
Telex: 051 883051

British Telecom International
I01.1 Rm. 820
Holborn Centre
120 Holborn
London ECIN 2TE, United Kingdom
Telephone: 71 4922000
Fax: 71 4045934
Telex: 21601 bti g

Mercury Communications Ltd.
26 Red Lion Square
London WC1R 4HQ, United Kingdom
Telephone: 71 5282000
Fax: 71 5282181
Telex: 051 910000 mercom g

Kingston Communications
Telephone House
Carr Lane
Kingston-Upon-Hull HUI3RE, United Kingdom
Telephone: 482-221-100
Fax: 482-206-52
Telex: 051 592531

Broadcasting Services

British Broadcasting Corporation - BBC
Broadcasting House
London W1A 1AA, United Kingdom
Telephone: 71 580 4468
Telex: +851 265781 or 267099

Independent Television Association - ITV
Knighton House
56 Mortimer Street
London WIN 8AN, United Kingdom
Telephone: 71 6128000
Fax: 71 5807892
Telex: +851 262988

British Sky Broadcasting
6 Centaurs Business Park
Grant Way, Isleworth
Middlesex, TW7 5QD, United Kingdom
Telephone: 71 7823000
Fax: 71 7823030

Channel 4 Television
60 Charlotte Street
London WIP 2AX, United Kingdom
Telephone: 71 6314444
Fax: 716371495
Telex: +851 892355

The Children's Channel
9-13 Grape Street
London, WC2H 8DR, United Kingdom
Telephone: 71 2403422
Fax: 71 4979113

Super Channel
Melrose House
14 Lanark Square
Lime Harbor
London E14 9QD, United Kingdom
Telephone: 71 4189418
Fax: 71 4189419-22
Telex: +851 920948

Cable News Network (CNN)
CNN International
CNN House
19-22 Rathbone Place
London W1P 1DF, United Kingdom
Telephone: 71 6376700
Fax: 71 6376768
Telex: +851 269169

Turner International
25-28 Old Burlington Street
London WIX 1LB, United Kingdom
Telephone: 71 4344341

Bravo
Twyman House
16 Bonny Street
London NW1 9PG, United Kingdom
Telephone: 71 4824824
Fax: 71 2842042

Other Recognized Operators

British Telecommunications Public Limited Co. (BT plc)

British Telecom Center
81 Newgate Street
London ECIA 7AJ, United Kingdom
Telephone: 71 3565000
Fax: 71 3565520
Telex: 051 883051

Official

British Telecom International
I01.1 Rm. 820
Holborn Centre
120 Holborn
London ECIN 2TE, United Kingdom
Telephone: 71 4922000
Fax: 71 4045934
Telex: 051 21601 bti g

Cable and Wireless Plc
New Mercury House
26 Red Lion Square
London WC1R 4UQ, United Kingdom
Telephone: 71 3154000
Fax: 71 3155000
Telex: 920000 candw g

The Commercial Cable Co.
Melbray House
Bastwick Street
London EC1V 3PH, United Kingdom
Telephone: 71 2511577
Telex: 22911 comcables ln g

Marconi Marine
Division of Marconi Communication System Ltd.
Elettra House
Westway
Chelmsford, Essex CM1 3BH, United Kingdom
Telephone: 71 261701
Fax: 71 358776
Telex: 99228 mim chd g

Mercury Communications Ltd.
26 Red Lion Square
London WC1R 4HQ, United Kingdom
Telephone: 71 5282000
Fax: 71 5282181
Telex: 051 910000 mercom g

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 17.070023%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: British Telecommunications International PLC (BTI)
Ownership: 12.05742%
Earth stations:
Goonhilly 1 (AOR spare) — 332.5 or 359.0
Goonhilly 1A (IOR major path) — 63.0 (by special arrangement)
Goonhilly 2 (AOR major path 1) — 325.5
Goonhilly 3 (IOR major path) — 63.0
Goonhilly 6 (AOR primary) — 335.5 (by special arrangement)
London Teleport 2 (AOR spare) — 332.5
Madley 1 (IOR primary) — 60.0
Madley 2 (AOR major path 2) — 342.0
Madley 3 (AOR spare) — 359.0
Madley 3A (IOR primary) — 60.0 (by special arrangement)
Madley 10 (AOR spare) — 332.5 (by special arrangement)

International Maritime Satellite Organization (Inmarsat)
Signatory: British Telecommunications International PLC
Ownership:
Earth station:
Goonhilly (AORE)
Goonhilly (AORW)

Domestic Satellite Network

Owner: British Sky Broadcasting (B-Sky-B)
Telephone: 71 782-3000
Fax: 71 782-3030

Satellite:
Marcopolo 1 329° E (31° W)

Range of Geostationary Satellites Visible

Location	Belfast
Lat.°	54.6N
Long.°	5.9W
°Long. Differ. Visible	66°
Eastern Limit for GSO	72°E
Western Limit for GSO	300°E (60°W)

Location	Edinburgh
Lat.°	55.9N
Long.°	3.2W
°Long. Differ. Visible	65°
Eastern Limit for GSO	0.1°W
Western Limit for GSO	292°E (68°W)

Location	London
Lat.°	51.5N
Long.°	0.1W
°Long. Differ. Visible	68°
Eastern Limit for GSO	68°E
Western Limit for GSO	292°E (68°W)

UNITED STATES

Official name: United States of America
Capital: Washington, DC
ITU country abbreviation: USA
ITU Region: 2

International telephone dialing code: 1
International telex dialing code: NA

Demographic and Physical Information

Area: 9.37 million km²
Population: 263.81 million
Major languages: English
Time zones: GMT - 5h to GMT - 10h

Telecommunications Statistics

Number of telephones: 126 million
Submarine cable connections: NA
Radio stations: 4,987AM, 4,932 FM
Television standard: NTSC M
Electrical standard: 127 vac, 60 Hz
State-run television networks: none
Private television networks: 4 (not including cable)
Television stations: 1,092 (about 9,000 cable TV systems)
Television sets: 193 million
TV households: NA
Cable penetration: >60%
VCR penetration: 70%
Satellite Earth stations: 45 Intelsat AOR, 16 Intelsat POR

Broadcasting Services

Capital Cities - ABC
77 West 66th Street
New York, NY 10023 USA
Telephone: +1 212 4567777
Fax: +1 212 8876850
Telex: 422003

CBS INC.
51 West 52nd Street
New York, NY 10019 USA
Telephone: +1 212 9754321
Fax: +1 212 9754226

NBC
30 Rockerfeller Plaza
New York, NY 10112 USA
Telephone: +1 212 6644444
Telex: 662131

Fox Broadcasting Company
10201 West Pico Blvd.
P.O. Box 900
Los Angeles, CA 90035 USA
Telephone: +1 310 2772211
Fax: +1 310 203 2735

Public Broadcasting System - PBS
1320 Braddock Place
Alexandria, VA 22314 USA
Telephone: +1 703 7395000
Fax: +1 703 7390775

Cable Networks

Entertainment and Sports Programming Network - ESPN
ESPN Plaza
Bristol, CT 06010 USA
Telephone: +1(203) 5852000
Fax: +1(203) 582 7699

Turner Broadcasting System Inc. - TBS/TNT/ Cartoon Network
1050 Techwood Dr., NW
Atlanta, GA 30348 USA
Telephone: +1(404) 8271500/1700/1717
Fax: +1(404) 8271464 (Programming)

Cable News Network - CNN
1 CNN Center
P.O. Box 105366
Atlanta, GA 30348 USA
Telephone: +1(404) 8271500/1700/1717
Fax: +1(404) 8271593 (News)

Home Box Office - HBO
1100 Ave. of the Americas
New York, NY 10036 USA
Telephone: +1(212) 5121000
Fax: +1(212) 5128700
Telex: 825 649

Showtime Networks, Inc. - The Movie Channel
1633 Broadway
New York, NY 10019 USA
Telephone: +1(212) 7081600
Fax: +1(212) 7083274 (Programs)

The Disney Channel
3800 W. Alameda
Burbank, CA 91505 USA
Telephone: +1(818) 5697500
Fax: +1(818) 5661358

USA Network
1230 Ave. of the Americas
New York, NY 10020 USA
Telephone: +1(212) 4089100
Fax: +1(212) 4083606

Discovery Channel
7700 Wisconsin Ave.
Bethesda, MD 20814 USA
Telephone: +1(301) 9861999
Fax: +1(301) 9864823

Arts and Entertainment - A&E
235 E. 45th Street
New York, NY 10017 USA
Telephone: +1(212) 6614500
Fax: +1(212) 2109755

Rainbow Program Entertainment - Bravo & America Movie Classics
150 Crossways Park West
Woodbury , NY 11797 USA
Telephone: +1(516) 3642222
Fax: +1(516) 3642297

Family Channel
1000 Centerville Turnpike
Virginia Beach, VA 23463 USA
Telephone: +1(804) 5237300
Fax: +1(804) 5237878

Lifetime
36-12 35th Ave.
Astoria, NY 11106 USA
Telephone: +1(718) 4824000
Fax: +1(718) 4821903

CNBC/FNN
2200 Fletcher Ave.
Fort Lee, NJ 07024 USA
Telephone: +1(201) 5856482
Fax: +1(201) 5856217

MTV Networks (MTV - Nickelodeon - Nick at Nite - VH-1)
1515 Broadway
New York, NY 10019 USA
Telephone: +1(212) 2588000

Entertainment Television (Formerly Movietime)
5670 Wilshire Blvd., 2nd Floor
Los Angeles, CA 90036 USA
Telephone: +1(213) 9542400
Fax: +1(213) 9542620

Univison
605 3rd Ave.
New York, NY 10158-0180 USA
Telephone: +1(212) 4555200
Fax: +1(212) 8676710

Other Recognized Operators

Aeronautical Radio, Inc.
2551 Riva Road
Annapolis, MD 21401 USA
Telephone: +1(301) 2664000
Telex: +710 867 8553

American Satellite Corp.
1801 Research Blvd.
Rockville, MD 20850 USA
Telephone: +1(301) 2518333

American Telephone and Telegraph Co.
Rt. 202/206 North, Rm. 5A216
Bedminster, NJ 07921 USA
Telephone: +1(201) 2343790
Fax: +1(201) 7819435
Telex: 216325 att ur

COMSAT Corporation
6560 Rock Spring Drive
Bethesda, MD 20817
Telephone: +1(301) 214-3000
Fax: +1(301) 214-7100

Credit Card Calling Systems, Inc.
67 Wall Street
New York, NY 10005 USA
Telephone: +1(212) 3238030
Fax: +1(212) 432 9366

General Communications, Inc.
2550 Denali St., Suite 100
Anchorage, AK 99503 USA
Telephone: +1(907) 2655600

General Electric Co.
401 N. Washington St.
Rockville, MD 20850 USA

Graphnet, Inc.
329 Alfred Ave.
Teaneck, NJ 07666 USA
Telephone: +1(201) 8375100
Telex: 3762430 ub

GTE Hawaiian Tel
P.O. Box 2200
Honolulu, HI 96841 USA
Telephone: +1(808) 5464511
Fax: +1(808) 5236899
Telex: 7431349 Hawtel

GTE SC/Telephone Operations
Williams Square - W. Tower
5205 N. O'Conner Blvd.
Irving, TX 75015-2092 USA

Infonet Service Corp.
2100 E. Grand Ave.
El Segundo, CA 90245 USA
Telephone: +1(213) 3352600
Fax: +1(213) 3229806
Telex: 210409 ubcstag ur

IT&E Overseas, Inc.
P.O. Box 24881
GMF
Guam 96921 USA

Keystone Communications, L.P.
1000 Keystone Bldg.
Salt Lake City, UT USA

MDC-TYMNET
2560 N. First Street
P.O. Box 49019
San Jose, CA 95161-9019 USA
Telephone: +1(408) 9220250
Fax: +1(408) 9226232

Net Express, Inc.
1953 Gallows Road, Suite 300
Vienna, VA 22180 USA

NYNEX Corp.
Science & Technology
Strategic Technology Planning
1113 Westchester Ave., Rm. 331L
White Plains , NY 10604 USA
Telephone: +1(914) 6446064
Fax: +1(914) 6442609

RCA Global Communications, Inc.
2 International Dr.
Rye Brook, NY 10573 USA
Telephone: +1(914) 9346303
Fax: +1(914) 9346961
Telex: 6502188984

Sprint International Communications Corp.
112490 Sunrise Valley
Reston, VA 22096 USA
Telephone: +1(703) 6896000

TRT/FTC Communications, Inc.
1331 Pennsylvania Ave.
Suite 1100
Washington, DC 20004 USA
Telephone: +1(202) 8792200
Fax: +1(202) 8792314
Telex: 197600 trt ut

UUNET Technologies, Inc.
3110 Fairview Park Dr., Suite 570
Falls Church, VA 22042 USA
Telephone: +1(703) 8765050
Fax: +1(703) 8765069

Wang Laboratories, Inc.
One Industrial Ave.
Lowell, MA 01851 USA
Telephone: +1(617) 4595000
Telex: 947421

Western Union International, Inc.
2 International Dr.
Rye Brook, NY 10573 USA
Telephone: +1(914) 9346303
Fax: +1(914) 9346961
Telex: 666101 mcii

Western Union Corp.
1 Lake Street
Upper Saddle River, NJ 07458 USA
Telephone: +1(201) 8185000
Fax: +1(201) 8186385
Telex: 427189

Worldcom Inc.
67 Broad St.
New York, NY 10004 USA
Telephone: +1(212) 6072524
Fax: +1(212) 6072517

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Communications Satellite Corporation (Comsat)
Ownership: 21.864515%
Earth stations:
Andover 3 (AOR major path 1) — 325.5
Andover 2 (AOR spare) — 359.0
Etam 2 (AOR primary) — 335.5
Etam 1 (AOR major path 2) — 342.0
Faifax 1 (AOR spare) — 332.5
Filmore (POR spare) — 180.0
Finegayan, Guam (POR spare) — 174.0
GTE Hawaiian (POR primary) — 174.0
Hickam, Hawaii (POR spare) — 174.0
Holmdel 1 (AOR spare) — 307.0
Houston Teleport 1 (AOR primary) — 335.5

Houston Teleport 2 (AOR spare) — 307
Jamesburg (POR primary) — 174.0
Los Angeles 3 (POR spare) — 180.0
Los Angeles 4 (POR spare) — 180.0
Los Angeles 1 (AOR spare) — 307.0
Pago Pago, Samoa (POR spare) — 174.0
Palau (POR spare) — 174.0
Paumalu, Hawaii 2 (POR spare) — 174.0
Point Reyes (POR primary) — 174.0
Pulantat 2, Guam (POR spare) — 174.0
Roaring Creek 1 (AOR major path 1) — 325.5
Santa Paula 4 (POR spare) — 180.0
Santa Paula 7 (AOR spare) — 307.0
Southbury TVRO (AOR spare) — 332.5
Staten Island 2 (AOR spare) — 332.5
Staten Island 6 (AOR major path) — 325.5
Staten Island 4 (AOR spare) — 307.0
Suspe, Saipan (POR spare) — 174.0
Triunfo Pass (POR spare) — 180.0
Turner Teleport (AOR spare) — 332.5
Washington International Teleport 1 (AOR primary) — 332.5
Washington International Teleport 2 (AOR spare) — 342.0
Yacolt 1 (POR spare) — 180.0
Yacolt 2 (POR primary) — 174.0

International Maritime Satellite Organization (Inmarsat)
Signatory: Comsat Mobile Communications
Ownership: NA
Earth stations:
Niles Canyon (AORW)
Niles Canyon (POR)
Santa Paula (POR)
Southbury (AORE)
Southbury (AORW)
Staten Island (AORE)

Domestic Satellite Network

For detailed information on US domestic satellites services, see Section 1 of this handbook.

Range of Geostationary Satellites Visible

Location	Anchorage, AK
Lat.°	61.2N
Long.°	149.8W
°Long. Differ. Visible	61°
Eastern Limit for GSO	271°E (89°W)
Western Limit for GSO	149°E (211°W)

Location	Atlanta, GA
Lat.°	33.8N
Long.°	84.4W
°Long. Differ. Visible	74°
Eastern Limit for GSO	350°E (10°W)
Western Limit for GSO	202°E (158°W)

Location	Boston, MA
Lat.°	42.3N
Long.°	71.1W
°Long. Differ. Visible	72°
Eastern Limit for GSO	1°E
Western Limit for GSO	217°E (143°W)

Location	Chicago, IL
Lat.°	41.8N
Long.°	87.7W
°Long. Differ. Visible	72°
Eastern Limit for GSO	344°E (16°W)
Western Limit for GSO	200°E (160°W)

Location	Honolulu, HI
Lat.°	21.3N
Long.°	157.9W
°Long. Differ. Visible	75°
Eastern Limit for GSO	277°E (83°W)
Western Limit for GSO	126°E (233°W)

Location	Houston, TX
Lat.°	29.8N
Long.°	95.3W
°Long. Differ. Visible	74°
Eastern Limit for GSO	339°E (21°W)
Western Limit for GSO	191°E (169°W)

Location	Juneau, AK
Lat.°	58.3N
Long.°	134.3W
°Long. Differ. Visible	64°
Eastern Limit for GSO	290°E (70°W)
Western Limit for GSO	168°E (192°W)

Location	Los Angeles, CA
Lat.°	34N
Long.°	118.2W
°Long. Differ. Visible	74°
Eastern Limit for GSO	316°E (44°W)
Western Limit for GSO	168°E(192°W)

Location	Miami, FL
Lat.°	25.7N
Long.°	80.2W
°Long. Differ. Visible	75°
Eastern Limit for GSO	355°E (5°W)
Western Limit for GSO	205°E (155°W)

Location	New York, NY
Lat.°	40.7N
Long.°	74W
°Long. Differ. Visible	72°
Eastern Limit for GSO	358°E (2°W)
Western Limit for GSO	214°E (146°W)

Location	San Francisco, CA
Lat.°	37.8N
Long.°	122.5W
°Long. Differ. Visible	73°
Eastern Limit for GSO	310°E (50°W)
Western Limit for GSO	164°E (196°W)

Location	New York, NY
Lat.°	40.7N
Long.°	74W
°Long. Differ. Visible	72°
Eastern Limit for GSO	358°E (2°W)
Western Limit for GSO	214°E (146°W)

Location	Seattle, WA
Lat.°	47.7N
Long.°	122.2W
°Long. Differ. Visible	70°
Eastern Limit for GSO	308°E (52°W)
Western Limit for GSO	168°E (192°W)

Location	St. Louis, MO
Lat.°	38.7N
Long.°	90.2W
°Long. Differ. Visible	73°
Eastern Limit for GSO	342°E (18°W)
Western Limit for GSO	197°E (163°W)

Location	Washington, DC
Lat.°	38.9N
Long.°	77W
°Long. Differ. Visible	73°
Eastern Limit for GSO	356°E (4°W)
Western Limit for GSO	210°E (150°W)

■ URUGUAY

Official name: Oriental Republic of Uruguay
Capital: Montevideo
ITU country abbreviation: URG
ITU Region: 2

International telephone dialing code: 598
International telex dialing code: 398

Demographic and Physical Information

Area: 176,220 km²
Population: 3.2 million
Major languages: Spanish
Time zones: GMT - 3h

Telecommunications Statistics

Number of telephones: 337,000
Submarine cable connections: none
Radio stations: 99 AM, 9 shortwave
Television standard: PAL N
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: 3
Television stations: 26
Television sets: NA
TV households: 600,000
Cable penetration: none
VCR penetration: 22%
Satellite Earth stations: 2 Intelsat AOR

Telecommunications Regulatory Organization

Ministerio de Defensa Nacional
Sarandi 472
Piso 1
Casilla de Correo 927
Montevideo, Uruguay
Telephone: +598 2 954068
Fax: +598 2 963351

Officials

Mariano Brito, Minister of Defense, Ronold Ubach, Deputy Director, Communications; Estaban Hackembruch, Director, Communications

Broadcasting Services

Canal 12 - Teledoce TV
Enriqueta Compte y Rique 1276
Montevideo, Uruguay
Telephone: +598 2 235856
Fax: +598 2 237623
Telex: +398 22403

Monte Carlo Television - Canal 4
Calle Paraguay 2253
Montevideo, Uruguay
Telephone: +598 2 234591/2
Fax: +598 2 942001
Telex: +398 23052

SAETA TV - Canal 10
Dr. Lorenzo Carnelli 1234
Montevideo, Uruguay
Telephone: +598 2 402120
Fax: +598 2 409771
Telex: +398 22666

SODRE - Canal 5
Calle Colorado 2362
Montevideo, Uruguay
Telephone: +598 2 806391 or 808515
Telex: +398 26602

Red Color TV
Dr. Lorenzo Carnelli 1234
Montevideo, Uruguay
Telephone: +598 2 417534/5
Fax: +598 2 409771
Telex: +398 22666

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Administracion Nacional de Telecomunicaciones
Ownership: 0.050000%
Earth stations:
Manga 1 (AOR primary) — 335.5
Manga 2 (AOR major path 1) — 325.5

Range of Geostationary Satellites Visible

Location	Montevideo
Lat.°	34.8S
Long.°	56.2W
° Long. Differ. Visible	73°
Eastern Limit for GSO	17°E
Western Limit for GSO	230°E (130°W)

■ UZBEKISTAN

Official name: Republic of Uzbekistan
Capital: Tashkent
ITU country abbreviation: UZB
ITU Region: 1

International telephone dialing code: 7
International telex dialing code: 0786

Demographic and Physical Information

Area: 447,400 km²
Population: 23.09 million
Major languages: Uzbek, Russian
Time zones: GMT + 4h30m

Telecommunications Statistics

Number of telephones: 1.46 million
Submarine cable connections: none
Radio stations: NA
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: NA
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: Orbita, Intelsat (receive only)

Telecommunications Regulatory Organization

Ministry of Communications
Ul. Aloxei Tolstoj 7
700000 Tashkent, Uzbekistan
Telephone: 3712-336053
Fax: 3712-441820
Telex: 064 116108

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Tashkent
Lat.°	41.3N
Long.°	69.2E
° Long. Differ. Visible	72°
Eastern Limit for GSO	141°E
Western Limit for GSO	357°E (3°W)

■ VANUATU

Official name: Republic of Vanuatu
Capital: Port-Vila
ITU country abbreviation: VUT
ITU Region: 3

International telephone dialing code: 678
International telex dialing code: NA

Demographic and Physical Information

Area: 14,760 km²
Population: 173,648
Major languages: English and French (both official)
Time zones: GMT + 12h

Telecommunications Statistics

Number of telephones: 3,000
Submarine cable connections: none
Radio stations: 2 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Telcom Vanuatu
P.O. Box 146
Port Vila, Vanuatu
Telephone: +678 22185
Fax: + 678 22628

Officials

Edward Nipake Natapei, Minister for Public Works; Henri Ramirez, Managing Director, Telcom Vanuatu; S.V. Korikalo, Manager, International Relations

Other Recognized Operators

Vanitel Ltd.
P.O. Box 164
Port Vila, Vanatu
Telephone: +678 22185
Fax: +678 22910
Telex: 1050 vatel nh

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Port-Vila
Lat.°	17.7S
Long.°	168.3E
°Long. Differ. Visible	76°
Eastern Limit for GSO	244°E
Western Limit for GSO	92°E

VATICAN CITY

Official name: State of the Vatican City
Capital: Vatican City
ITU country abbreviation: CVA
ITU Region: 1

International telephone dialing code: 396
International telex dialing code: 0504

Demographic and Physical Information

Area: 0.438 km²
Population: 802
Major languages: Italian, Latin
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: 2,000
Submarine cable connections: none
Radio stations: 3 AM, 4 FM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Posts and Telecommunications Administration
General Secretariat
Vatican City
Telephone: 6 6982
Fax: 6 6985378
Telex: 0504 2024

Broadcasting Services

Radio Vatican
Direction Généerale
Cita' Del Vaticano
Vatican City
Telephone: 6 6983945
Telex: 0504 2023 sevradio va

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.05%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Vatican City State
Ownership: 0.050000%
Earth stations: none

Range of Geostationary Satellites Visible

Location	Vatican City
Lat.°	41.9N
Long.°	12.4E
°Long. Differ. Visible	72°
Eastern Limit for GSO	84°E
Western Limit for GSO	300°E (60°W)

VENEZUELA

Official name: Republic of Venezuela
Capital: Caracas
ITU country abbreviation: VEN
ITU Region: 2

International telephone dialing code: 58
International telex dialing code: 395

Demographic and Physical Information

Area: 912,050 km²
Population: 21.0 million
Major languages: Spanish
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 1.44 million
Submarine cable connections: 3
Radio stations: 181 AM, 26 shortwave
Television standard: NTSC M
Electrical standard: 120 vac, 60 Hz
State-run television networks: 1
Private television networks: 4
Television stations: 59
Television sets: NA
TV households: 3.3 million
Cable penetration: 2%
VCR penetration: 29%
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Ministerio de Transportes y Comunicaciones
Apartado No. 17-174
1020 Caracas, Venezuela
Telephone: +58 2 1000
Fax: +58 574-3043

Officials

Roberto Smith, Minister of Transport and Communications; José Luis Bruzual, Director-General; Freddy Franco Mambel, Director-General, Communications

Broadcasting Services

Radio Caracas Television - Canal 2 - RCTV
2da. Los Cortijos de Lourdes
Caracas 2057, Venezuela
Telephone: +58 2 2561665 or 2564464
Fax: +58 2 2561812
Telex: +395 031 21527

Venevision - Canal 4
Ave. LaSalle con Calle Bellavista
Colina de los Caobos
Apartado 6674, Caracas 105, Venezuela
Telephone: +58 2 7824444 or 7814935
Fax: +58 2 7817334 or 2392675
Telex: +395 031 21144

Venezolana de Television - Canal 8
Ave. Montercristo
Los Ruices
Caracas, Venezuela
Telephone: +58 2 2399811 or 2399164
Fax: +58 2 2357334 or 2392675
Telex: +395 031 25412

Televen - Canal 10
Ave. Francisco de Miranda
e Principal de los Ruices
Caracas, Venezuela
Telephone: +58 2 2217511
Fax: +58 2 6627297

Televisora Andina de Merida - Canal 6 TAM
Calle 23, Entre a Ave. 4 y 5
Merida, Venezuela
Telephone: +58 74 5252408 or 710649
Fax: +58 74 7825097
Telex: +58 74 74287

Other Recognized Operators

Instito Postal Telegráfico de Venezuela (Ipostel)
Oficina de Relaciones Internacionales
Divisíon Telegrafica Internacional
3 piso
Centro Postal Caracas
Apartado Postal 3877
Caracas, Venezuela
Telephone: +58 2 4622633
Fax: +58 2 4613797
Telex: 24147 ript ve

Compañía Anónima Nacional Telefonos de Venezuela (Cantv)
Gerencia de Operaciones Internacionales
Apartado 6353
Caracas, Venezuela
Telephone: +58 2 7825346
Fax: +58 2 5732408
Telex: 21380 cantv vc

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Compania Anonima Nacional Telefonos de Venezuela (Cantv)
Ownership: 0.938148%
Earth stations:
Camatagua 1 (AOR major path 1) — 325.5
Camatagua 2 (AOR primary) — 335.5
Camatagua 4 (AOR spare) — 332.5
Camatagua 5 (AOR major path 2) — 342.0

Range of Geostationary Satellites Visible

Location	Caracas
Lat.°	10.5N
Long.°	66.9W
°Long. Differ. Visible	76°
Eastern Limit for GSO	9°E
Western Limit for GSO	217°E (143°W)

VIETNAM

Official name: Socialist Republic of Vietnam
Capital: Hanoi
ITU country abbreviation: VTN
ITU Region: 3

International telephone dialing code: 84
International telex dialing code: 798

Demographic and Physical Information

Area: 329,560 km²
Population: 74.3 million
Major languages: Vietnamese (official); French, Chinese
Time zones: GMT + 7h

Telecommunications Statistics

Number of telephones: 2 per 1,000
Submarine cable connections: NA
Radio stations: 228 FM
Television standard: VHF: SECAM D; UHF: SECAM K
Electrical standard: 120, 127, and 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 36 (77 repeaters)
Television sets: 2.5 million
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Telecommunications Regulatory Organization

Ministry of Transport and Communications
80 Tran Hung Dao Street, Hanoi 10 000, Vietnam
+84 4 52079

Officials
Bui Danh Luu, Minister of Transport and Communications; Le Kha, Vice-Minister, Posts and Telecommunications; Le Due Niem, Director, Posts and Telecommunications; Pham Van Danh, Director, International Relations

Broadcasting Services

Central TV Studios of Vietnam
85 Kuan Su
Hanoi, Vietnam
Telephone: +84 51434/5

International Telecommunications Organization Membership

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Direction Generale des Postes et Telecommunications de la Republique Socialiste du Viet Nam
Ownership: 0.050000%
Earth stations: NA

Range of Geostationary Satellites Visible

Location	Hanoi
Lat.°	21.1N
Long.°	105.9E
°Long. Differ. Visible	76°
Eastern Limit for GSO	181°E
Western Limit for GSO	30°E

VIRGIN GORDA (UNITED KINGDOM)

see British Virgin Islands

Range of Geostationary Satellites Visible

Location	Virgin Gorda
Lat.°	18.5N
Long.°	64.4W
°Long. Differ. Visible	76°
Eastern Limit for GSO	11°E
Western Limit for GSO	220°E (140°W)

VIRGIN ISLANDS (UNITED STATES)

Official name: Virgin Islands of the United States
Capital: Charlotte Amalie
Status: organized, unincorporated territory of the United States
ITU abbreviation: VIR
ITU Region: 2

International telephone dialing code: 1+809
International telex dialing code: NA

Demographic and Physical Information

Area: 352 km²
Population: 97,229
Major languages: English (official); Spanish, Creole
Time zones: GMT - 4h

Telecommunications Statistics

Number of telephones: 58,931
Submarine cable connections: some
Radio stations: 4 AM, 8 FM
Television standard: NTSC M
Electrical standard: 120 vac, 60 Hz
State-run television networks: none
Private television networks: 2
Television stations: 4
Television sets: 63,000
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: NA

Other Recognized Operators

ITT Communications, Inc.
Virgin Islands
P.O. Box 3768
Charlotte Amalie
St. Thomas 00801 United States Virgin Islands
Telephone: +1(809) 7745022
Telex: 3470005 ittcivi

Western Union International Carribean, Inc.
Box 366
Christansted
St. Croix 00820 United States Virgin Islands
Telephones: +1(809) 7730235
Telex: 367823 or 3673417 wui carib

Virgin Island Telephone Corp.
P.O. Box 1141
Charlotte Amalie, United States Virgin Island
Telephone: +1(809) 7745555
Telex: 3472212

Carribean Automated Long Lines Services, Inc. (CALLS)
No. 41 Sub Base
St. Thomas 00802-9801 United States Virgin Islands
Telephone: +1(809) 7765101

Range of Geostationary Satellites Visible

Location	St. Thomas
Lat.°	18.7N
Long.°	64.5W
°Long. Differ. Visible	76°
Eastern Limit for GSO	11°E
Western Limit for GSO	220°E (140°W)

WAKE ISLAND (UNITED STATES)

Range of Geostationary Satellites Visible

Location	Wake Island
Lat.°	19.3N
Long.°	166.6E
°Long. Differ. Visible	76°
Eastern Limit for GSO	242°E
Western Limit for GSO	91°E

WALLIS AND FUTUNA (FRANCE)

Official name: Territory of the Wallis and Futuna Islands
Capital: Mata Utu
Status: overseas territory of France
ITU abbreviation: WAL
ITU Region: 3

International telephone dialing code: 681
International telex dialing code: NA

Demographic and Physical Information

Area: 274 km²
Population: 14,499
Major languages: French, Wallisian
Time zones: GMT - 10h

Telecommunications Statistics

Number of telephones: 225
Submarine cable connections: NA
Radio stations: 1 AM
Television standard: none
Electrical standard: NA
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration:
VCR penetration: none
Satellite Earth stations: NA

Telecommunications Regulatory Organization

M. l'Administrateur Supérieur des Iles Wallis et Futana
Maua-Utu, Wallis and Futuna

France Cables et Radio - FCR
Télécommunications extérieures de Wallis-et-Futana
BP No. 54
Mata-Utu, Wallis and Futana
Telephone: +681 722443
Fax: +681 722255
Telex: (0707) 5801

Range of Geostationary Satellites Visible

Location	Mata-Utu
Lat.°	13.3S
Long.°	176.2W
°Long. Differ. Visible	76°
Eastern Limit for GSO	252°E
Western Limit for GSO	100°E

WESTERN SAHARA

Status: region disputed among Morocco, Mauretania and guerilla group
ITU abbreviation: AOE
ITU Region: 1

International telephone dialing code: 685
International telex dialing code: NA

Demographic and Physical Information

Area: 266,000 km²
Population: 217,211
Major languages: Hassaniya Arabic, Moroccan Arabic
Time zones: GMT

Telecommunications Statistics

Number of telephones: 2,000
Submarine cable connections: none
Radio stations: 2 AM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 2
Television sets: NA
TV households: NA
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 2 Intelsat AOR

Range of Geostationary Satellites Visible

Location	Morocco
Lat.°	25N
Long.°	13W
°Long. Differ. Visible	75°
Eastern Limit for GSO	62°E
Western Limit for GSO	272°E (88°W)

WESTERN SAMOA

Official name: Independent State of Western Samoa
Capital: Apia
ITU country abbreviation: SMO
ITU Region: 3

International telephone dialing code: 685
International telex dialing code: NA

Demographic and Physical Information

Area: 2,860 km²
Population: 209,360
Major languages: Samoan, English
Time zones: GMT - 11h

Telecommunications Statistics

Number of telephones: 7,500
Submarine cable connections: NA
Radio stations: 1 AM
Television standard: none
Electrical standard: 230 vac, 50 Hz
State-run television networks: none
Private television networks: none
Television stations: none
Television sets: none
TV households: none
Cable penetration: none
VCR penetration: none
Satellite Earth stations: 1 Intelsat POR

Telecommunications Regulatory Organization

Posts and Telecommunications Department
General Post Office
Apia, Western Samoa
Telephone: +685 24671
Fax: (G2/3) +685 24000

Officials

S.R. Petaia, Director, Posts and Telecommunications

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

Range of Geostationary Satellites Visible

Location	Apia
Lat.°	13.8S
Long.°	171.7W
° Long. Differ. Visible	76°
Eastern Limit for GSO	248°E
Western Limit for GSO	96°E

YEMEN

Official name: Republic of Yemen
Capital: Sanaa
ITU country abbreviation: YEM
ITU Region: 1

International telephone dialing code: 967
International telex dialing code: 0595

Demographic and Physical Information

Area: 527,970 km²
Population: 14.73 million
Major languages: Arabic
Time zones: GMT + 3h

Telecommunications Statistics

Number of telephones: 65,000
Submarine cable connections: NA
Radio stations: 4 AM, 1 FM
Television standard: PAL B
Electrical standard: 230 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 10
Television sets: >500,000
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 2 Intelsat IOR, 1 Intersputnik, 2 Arabsat

Telecommunications Regulatory Organization

Ministry of Communications
General Directorate of Telecommunications
P.O. Box 25237
Al-Jiraf Sana'a, Yemen
Telephone: 2 271106
Fax: 2 271158

Officials
Ahmed Al-Anessi, Minister of Communications; Abdull Qadar Ibrahim, Director General of Telecommunications

Telecommunications Operator

Yemen Telecommunication Corporation
P.O. Box 17045
Algiraff
Sana'a, Yeman
Telephone: 1-231800
Fax: 1-225606
Telex: 0895 2256

Official
Abdullah Al-Hammami, Director General

Broadcasting Services

Radio Television Yemenite
BP 1140
Sana'a, Yeman
Telex: +948(or 956) 25 0216

Sana'a Television
Ministry of Information
Sana'a, Yemen
Telephone: 2 2231181
Telex: +948(or 956) 2278

Other Recognized Operators

Yemen International Telecommunications Co. (LLC)
(TELEYEMEN)
Algiraff
P.O. Box 168
Sana'a, Yemen
Telephone: 2 231800
Fax: 2 225606
Telex: 0895 2256 telymn ye

International Telecommunications Organization Membership

Arab Satellite Communications Organization (Arabsat)
Signatory: Government of the Republic of Yemen
Ownership: NA
Earth station: NA

International Organization of Space Communications (Intersputnik)

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Republic of Yemen
Ownership: 0.161255%
Earth stations:
Ras Boradli (IOR primary) — 60.0
Sanaa 1 (IOR primary) — 60.0
Sanaa 2 (AOR major path 2) — 342.0

Range of Geostationary Satellites Visible

Location	Sanaa
Lat.°	15.4N
Long.°	44.2W
° Long. Differ. Visible	76°
Eastern Limit for GSO	120°E
Western Limit for GSO	299°E (61°W)

YUGOSLAVIA

See also Bosnia-Herzovina, Croatia, Slovenia, and Macedonia
ITU country abbreviation: YUG
ITU Region: 1

International telephone dialing code: 381
International telex dialing code: 062

Demographic and Physical Information

(figures are for Serbia and Montenegro)
Area: 102,350 km²
Population: 11.1 million
Major languages: Serbo-Croatian
Time zones: GMT + 1h

Telecommunications Statistics

(figures are for Serbia and Montenegro)
Number of telephones: 700,000
Submarine cable connections: NA
Radio stations: 26 AM, 9 FM
Television standard: NA
Electrical standard: NA
State-run television networks: NA
Private television networks: NA
Television stations: 18
Television sets: 1,000,000
TV households: 100,000
Cable penetration: NA
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

Community of Yugoslav Posts, Telegraphs and Telephones
Palmoticeva, 1
YU 11001 Belgrade, Yugoslavia
Telephone: 11 338921
Fax: 11 636917
Telex: 062 11421

Broadcasting Services

Yugoslav Radiotelevision
Generala Zdanola 28
YU 11000 Belgrade, Yugoslavia
Telephone: 11 330194
Fax: 11 434023

International Telecommunications Organization Membership

European Telecommunications Satellite Organization (Eutelsat); investment share 0.9245%

International Maritime Satellite Organization (Inmarsat); investment share 0.09809%

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Telecommunications Service
Ownership: 0.277053%
Earth stations:
Jugoslavija 1 (IOR primary) -- 60.0
Jugoslavija 2 (AOR primary) -- 335.5

Range of Geostationary Satellites Visable

Location	Belgrade
Lat.°	45N
Long.°	21E
°Long. Differ. Visible	72°
Eastern Limit for GSO	93°E
Western Limit for GSO	309°E (51°W)

■ ZAIRE

Official name: Republic of Zaire
Capital: Kinshasa
ITU country abbreviation: ZAI
ITU Region: 1

International telephone dialing code: 243
International telex dialing code: 968

Demographic and Physical Information

Area: 2.35 million km^2
Population: 44.06 million
Major languages: French, Lingala, Swahili, Kingwana, Kikongo, Tshiluba
Time zones: GMT + 1h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 10 AM, 4 FM
Television standard: SECAM K1
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 18
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 14 domestic

Telecommunications Regulatory Organization

Département des Postes et des Telecomminications
Boîte Postale 800, Kinshasa-1, Zaire
Telephone: +243 12 23123

Officials

Ileo Itambala, State Commissioner, Posts and Telecommunications
Cioyen Président Délégué général de l'Office National des Postes et des Télécommunications du Ziare
Boîte Postale 7070
Kinshassa-1, Ziare
Telephone: +243 12 22676
Telex: 21480 dg-onptz zr

Broadcasting Services

Zaire Television - OZRT
Cite dela Voix du Zaire
Avenue Kabina
Zone Lingwala B.P. 3164
Kinshasa/Gombe, Zaire
Telephone: +243 12 61725, 23175, or 21221
Telex: +968 21583

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Office National des Postes et Telecommunications de Zaire (ONPTZ)
Ownership: 0.153676%
Earth stations:
N'sele (AOR primary) — 335.5

Range of Geostationary Satellites Visible

Location	Kinshasa
Lat.°	4.3S
Long.°	15.2E
°Long. Differ. Visible	76°
Eastern Limit for GSO	92°E
Western Limit for GSO	299°E (61°W)

■ ZAMBIA

Official name: Republic of Zambia
Capital: Lusaka
ITU country abbreviation: ZMB
ITU Region: 1

International telephone dialing code: 260
International telex dialing code: 965

Demographic and Physical Information

Area: 752,610 km^2
Population: 9.45 million
Major languages: English (official)
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: NA
Submarine cable connections: NA
Radio stations: 11 AM, 5 FM
Television standard: VHF: PAL B; UHF: PAL G
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 9
Television sets: NA
TV households: NA
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR, 1 Intelsat IOR

Telecommunications Regulatory Organization

Ministry of Power, Transport and Communications
Fairley Road, P.O. Box 50065, Lusaka, Zambia
+260 1 213211

Officials

N.B. Nyoni, Permanent Secretary; H. Haimbe, Minister

Broadcasting Services

Zambia Broadcasting Services
Broadcasting House
Mass Media Complex
P.O. Box 50015
Lusaka, Zambia
Telephone: +260 1 253025 or 219673
Telex: +965 41221

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of the Republic of Zambia
Ownership: 0.118595%
Earth stations:
Mwembeshi (IOR primary) — 60.0
Mwembeshi (AOR major path) — 342.0

Range of Geostationary Satellites Visible

Location	Lusaka
Lat.°	15.5S
Long.°	28.3E
°Long. Differ. Visible	76°
Eastern Limit for GSO	104°E
Western Limit for GSO	312°E (48°W)

■ ZIMBABWE

Official name: Republic of Zimbabwe
Capital: Harare
ITU country abbreviation: ZWE
ITU Region: 1

International telephone dialing code: 263
International telex dialing code: 987

Demographic and Physical Information

Area: 390,580 km²
Population: 11.14 million
Major languages: English (official), Shona, Sindebele
Time zones: GMT + 2h

Telecommunications Statistics

Number of telephones: 247,000
Submarine cable connections: NA
Radio stations: 8 AM, 18 FM
Television standard: VHF: PAL B; UHF: PALG
Electrical standard: 220 vac, 50 Hz
State-run television networks: 1
Private television networks: none
Television stations: 8
Television sets: NA
TV households: 130,000
Cable penetration: none
VCR penetration: NA
Satellite Earth stations: 1 Intelsat AOR

Telecommunications Regulatory Organization

The Postmaster General
Posts and Telecommunication Corporation
Headquarters
P.O. Box 8061
Causeway
Harare, Zimbabwe
Telephone: +263 4 728811
Fax: +263 4 731989
Telex: +987 24821 pttchq zw

Officials

Mrs. Victoria Chitepo, Minister of Information;
Mr. Raymand Mutambirwa, Postmaster General

Broadcasting Services

Zimbabwe Broadcasting Corporation
P.O. Box HG 444
Highlands
Harare, Zimbabwe
Telephone: +263 4 729661 or 707222
Telex: +987 24223 or 244175

International Telecommunications Organization Membership

International Telecommunication Union (ITU)

International Telecommunications Satellite Organization (Intelsat)
Signatory: Government of Zimbabwe/Post Telecom Co.
Ownership: 0.050000%
Earth stations:
Mazowe (AOR major path) — 342.0

Range of Geostationary Satellites Visible

Location	Harare
Lat.°	17.7S
Long.°	31E
°Long. Differ. Visible	76°
Eastern Limit for GSO	107°E
Western Limit for GSO	315°E (45°W)

SECTION 9

REFERENCE DATA

Included in This Section:

This section contains charts, tables and graphs with useful information such as antenna pointing, dates of eclipses, climate types, rain margins and other data that affect worldwide satellite access.

ITU NAMES AND ABBREVIATIONS

Alphabetical by country name:

Afghanistan	AFG
Albania	ALB
Algeria	ALG
American Samoa	SMA
Andorra	AND
Angola	AGL
Anguilla	AIA
Antigua and Barbuda	ATG
Argentina	ARG
Armenia	ARM
Aruba	ABW
Ascension Island	ASC
Australia	AUS
Austria	AUT
Azerbaijan	AZE
Azores Islands	AZR
Bahamas, The	BAH
Bahrain	BHR
Bangladesh	BGD
Barbados	BRB
Barbuda	ATG
Belarus	BLR
Belgium	BEL
Belize	BLZ
Benin	BEN
Bermuda	BER
Bhutan	BTN
Bolivia	BOL
Bonaire	ATN
Borneo	none
Bosnia-Herzegovina	BIH
Botswana	BOT
Brazil	B
British Virgin Islands	VRG
Brunei	BRU
Bulgaria	BUL
Burkina Faso	BFA
Burma (Myanmar)	BRM
Burundi	BDI
Cambodia	CBG
Cameroon	CME
Canada	CAN
Canary Islands (Spain)	none
Cape Verde	CPV
Cayman Islands	CYM
Central African Republic	CAF
Chad	TCD
Chagos Islands	BIO
Chile	CHL
China, People's Republic of	CHN
Christmas Island	CHR
Cocos (Keeling) Islands	ICO
Colombia	CLM
Comoros	COM
Congo	COG
Cook Islands	CKH
Costa Rica	CTR
Croatia	HRV
Crozet Archipelago	CRO
Cuba	CUB
Curaçao	ATN
Cyprus	CYP
Czech Republic	CZE
Denmark	DNK
Diego Garcia	DGA
Djibouti	DJI
Dominica	DMA
Dominican Republic	DOM
East Timor	TMP
Easter Island	PAQ
Ecuador	EQA
Egypt	EGY
El Salvador	SLV
Equatorial Guinea	GNE
Eritrea	ERI
Estonia	EST
Ethiopia	ETH
Falkland Islands [Islas Malvinas]	FLK
Faroe Islands	FRO
Fiji	FJI
Finland	FIN
France	F
French Guiana	GUF
French Polynesia	OCE
Gabon	GAB
Gambia, The	GMB

Georgia	GEO
Germany	D
Ghana	GHA
Gibraltar	GIB
Great Britain (United Kingdom)	G
Greece	GRC
Greenland	GRL
Grenada	GRD
Guadeloupe	GDL
Guam	GUM
Guatemala	GTM
Guinea	GUI
Guinea-Bissau	GNB
Guyana	GUY
Haiti	HTI
Honduras	HND
Hong Kong	HKG
Hungary	HNG
Iceland	ISL
India	IND
Indonesia	INS
Iran	IRN
Iraq	IRQ
Ireland	IRL
Israel	ISR
Italy	I
Ivory Coast	CTI
Jamaica	JMC
Japan	J
Jarvis Island	JAR
Johnston Island	JON
Jordan	JOR
Kazakhstan	KAZ
Kenya	KEN
Kerguelen	KER
Kiribati	KIR
Korea, North	KRE
Korea, South (Republic of)	KOR
Kuwait	KWT
Kyrgyzstan	KGZ
Laos	LAO
Latvia	LVA
Lebanon	LBN
Leeward Islands	LEE
Lesotho	LSO
Liberia	LBR
Libya	LBY
Liechtenstein	LIE
Lithuania	LTU
Luxembourg	LUX
Macau	MAC
Macedonia	none
Madagascar	MDG
Madeira	MDR
Malawi	MWI
Malaysia	MLA
Maldives	MLD
Mali	MLI
Malta	MLT
Malvinas, Islas (Falkland Islands)	FLK
Marion Island	MRN
Marshall Islands	MHL
Martinique	MRT
Mauritania	MTN
Mauritius	MAU
Mayotte	MYT
Mexico	MEX
Micronesia, Federated States of	FSM
Midway Island	MDW
Moldova	MDA
Monaco	MCO
Mongolia	MNG
Montenegro	none
Montserrat	MSR
Morocco	MRC
Mozambique	MOZ
Myanmar	BRM
Namibia	NMB
Nauru	NRU
Nepal	NPL
Netherlands	HOL
Netherlands Antilles	ATN
Nevis (St. Kitts and Nevis)	SCN
New Caledonia	NCL
New Zealand	NZL
Nicaragua	NCG
Niger	NGR
Nigeria	NIG
Niue	NIU
Norfolk Island	NFK
North Korea	KRE
Northern Ireland (United Kingdom)	G
Northern Mariana Islands	MRA
Norway	NOR

Oman	OMA
Pacific Islands, Trust Territory (Palau)	PLW
Pakistan	PAK
Palmyra Island	PLM
Panama	PNR
Papua New Guinea	PNG
Paraguay	PRG
Peru	PRU
Philippines	PHL
Phoenix Island	PHX
Pitcairn	PTC
Poland	POL
Portugal	POR
Puerto Rico	PTR
Qatar	QAT
Réunion Island	REU
Rodriques Island	ROD
Romania	ROU
Russia (Russian Federation)	RUS
Rwanda	RRW
Saba	ATN
San Marino	SMR
São Tome and Principe	STP
Saudi Arabia	ARS
Senegal	SEN
Serbia	none
Seychelles	SEY
Sierra Leone	SRL
Singapore	SNG
Slovakia (Slovak Republic)	SVK
Slovenia	SVN
Solomon Islands	SLM
Somalia	SOM
South Africa	AFS
South Korea	KOR
Spain	E
Sri Lanka	CLN
St. Croix	VIR
St. Eustatius	ATN
St. Helena	SHN
St. Johns	VIR
St. Kitts and Nevis	SCN
St. Lucia	LCA
St. Maarten	ATN
St. Martin	none
St. Pierre and Miquelon	SPM
St. Thomas	VIR
St. Vincent and the Grenadines	VCT
Sudan	SDN
Suriname	SUR
Swan Island	SWN
Swaziland	SWZ
Sweden	S
Switzerland	SUI
Syria	SYR
Tahiti	OCE
Taiwan	none
Tajikistan	TJK
Tanzania	TZA
Thailand	THA
Tobago (Trinidad and Tobago)	TRD
Togo	TGO
Tokelau (New Zealand)	TKL
Tonga	TON
Tortola	VRG
Trinidad and Tobago	TRD
Tristan da Cunha	TRC
Tunisia	TUN
Turkey	TUR
Turkmenistan	TKM
Turks and Caicos Islands (United Kingdom)	TCA
Tuvalu	TUV
Uganda	UGA
Ukraine	UKR
United Arab Emirates	UAE
United Kingdom	G
United States	USA
Uruguay	URG
Uzbekistan	UZB
Vanuatu	VUT
Vatican City	CVA
Venezuela	VEN
Vietnam	VTN
Virgin Gorda (British Virgin Islands)	VRG
Virgin Islands (U.S.)	VIR
Wallis and Futuna (France)	WAL
Western Sahara	AOE
Western Samoa	SMO
Yemen	YEM
Yugoslavia	YUG
Zaire	ZAI
Zambia	ZMB
Zimbabwe	ZWE

Alphabetical by abbreviation:

ABW	Aruba
AFG	Afghanistan
AFS	South Africa
AGL	Angola
AIA	Anguilla
ALB	Albania
ALG	Algeria
AND	Andorra
AOE	Western Sahara
ARG	Argentina
ARM	Armenia
ARS	Saudi Arabia
ASC	Ascension Island
ATG	Barbuda
ATG	Antigua and Barbuda
ATN	St. Maarten
ATN	Netherlands Antilles
ATN	Bonaire
ATN	Curaçao
ATN	Saba
ATN	St. Eustatius
AUS	Australia
AUT	Austria
AZE	Azerbaijan
AZR	Azores Islands
B	Brazil
BAH	Bahamas, The
BDI	Burundi
BEL	Belgium
BEN	Benin
BER	Bermuda
BFA	Burkina Faso
BGD	Bangladesh
BHR	Bahrain
BIH	Bosnia-Herzegovina
BIO	Chagos Islands
BLR	Belarus
BLZ	Belize
BOL	Bolivia
BOT	Botswana
BRB	Barbados
BRM	Myanmar
BRM	Burma (Myanmar)
BRU	Brunei
BTN	Bhutan
BUL	Bulgaria
CAF	Central Africa Republic
CAN	Canada
CBG	Cambodia
CHL	Chile
CHN	China, People's Republic of
CHR	Christmas Island
CKH	Cook Islands
CLM	Colombia
CLN	Sri Lanka
CME	Cameroon
COG	Congo
COM	Comoros
CPV	Cape Verde
CRO	Crozet Archipelago
CTI	Ivory Coast
CTR	Costa Rica
CUB	Cuba
CVA	Vatican City
CYM	Cayman Islands
CYP	Cyprus
CZE	Czech Republic
D	Germany
DGA	Diego Garcia
DJI	Djibouti
DMA	Dominica
DNK	Denmark
DOM	Dominican Republic
E	Spain
EGY	Egypt
EQA	Ecuador
ERI	Eritrea
EST	Estonia
ETH	Ethiopia
F	France
FIN	Finland
FJI	Fiji
FLK	Falkland Islands (Islas Malvinas)
FRO	Faroe Islands
FSM	Micronesia, Federated States of
G	Northern Ireland (United Kingdom)
G	United Kingdom
G	Great Britain (United Kingdom)
GAB	Gabon
GDL	Guadeloupe

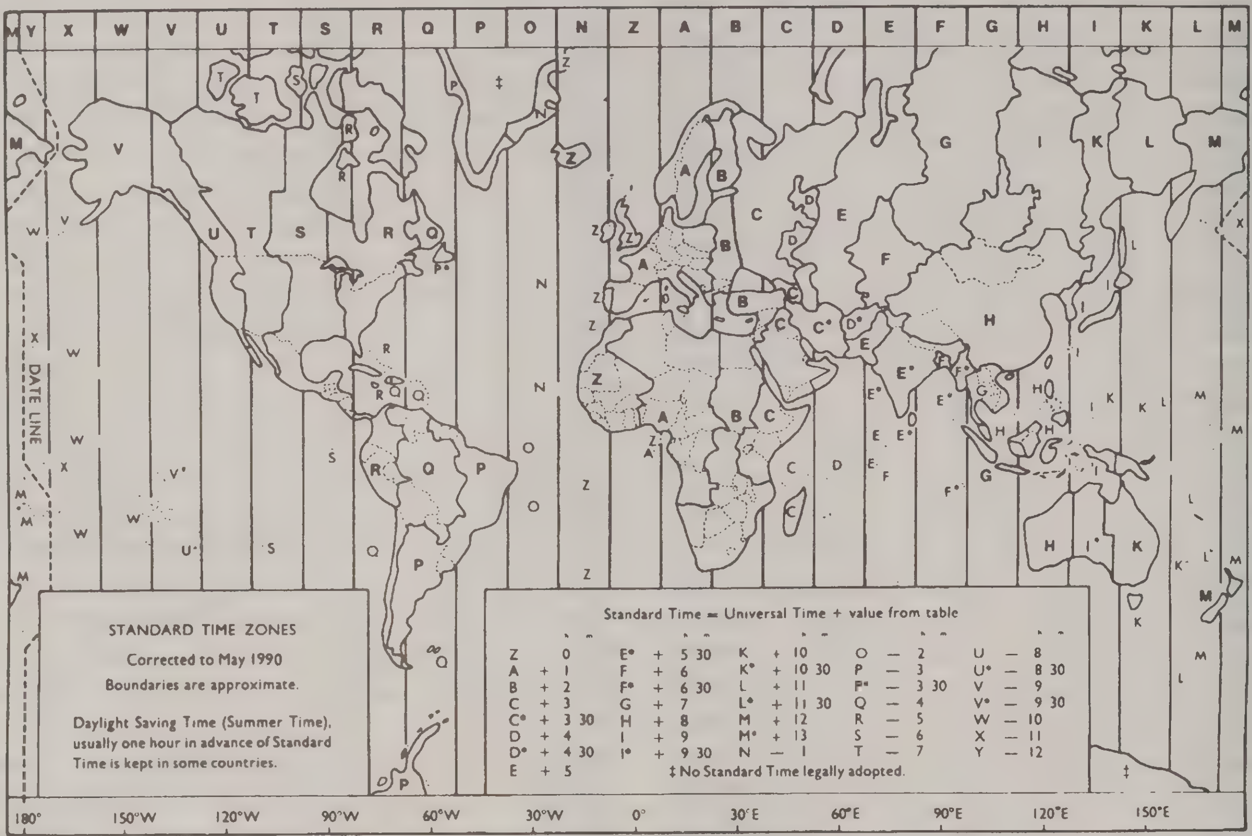
GEO	Georgia
GHA	Ghana
GIB	Gibraltar
GMB	Gambia, The
GNB	Guinea-Bissau
GNE	Equatorial Guinea
GRC	Greece
GRD	Grenada
GRL	Greenland
GTM	Guatemala
GUF	French Guiana
GUI	Guinea
GUM	Guam
GUY	Guyana
HKG	Hong Kong
HND	Honduras
HNG	Hungary
HOL	Netherlands
HRV	Croatia
HTI	Haiti
I	Italy
ICQ	Cocos (Keeling) Islands
IND	India
INS	Indonesia
IRL	Ireland
IRN	Iran
IRQ	Iraq
ISL	Iceland
ISR	Israel
J	Japan
JAR	Jarvis Island
JMC	Jamaica
JON	Johnston Island
JOR	Jordan
KAZ	Kazakhstan
KEN	Kenya
KER	Kerguelen
KGZ	Kyrgyzstan
KIR	Kiribati
KOR	Korea, South (Republic of)
KRE	Korea, North
KWT	Kuwait
LAO	Laos
LBN	Lebanon
LBR	Liberia
LBY	Libya
LCA	St. Lucia
LEE	Leeward Islands
LIE	Liechtenstein
LIU	Lithuania
LSO	Lesotho
LUX	Luxembourg
LVA	Latvia
MAC	Macau
MAU	Mauritius
MCO	Monaco
MDA	Moldova
MDG	Madagascar
MDR	Madeira
MDW	Midway
MEX	Mexico
MHL	Marshall Islands
MLA	Malaysia
MLD	Maldives
MLI	Mali
MLT	Malta
MNG	Mongolia
MOZ	Mozambique
MRA	Northern Mariana Islands
MRC	Morocco
MRN	Marion Island
MRT	Martinique
MSR	Montserrat
MTN	Mauritania
MWI	Malawi
MYT	Mayotte
NCG	Nicaragua
NCL	New Caledonia
NFK	Norfolk Island
NGR	Niger
NIG	Nigeria
NIU	Niue
NMB	Namibia
NOR	Norway
NPL	Nepal
NRU	Nauru
NZL	New Zealand
OCE	French Polynesia
OCE	Tahiti
OMA	Oman
PAK	Pakistan
PAQ	Easter Island
PHL	Philippines
PHX	Phoenix Island

PLM	Palmyra Island
PLW	Pacific Islands Territory (Palau)
PNG	Papua New Guinea
PNR	Panama
POL	Poland
POR	Portugal
PRG	Paraguay
PRU	Peru
PTC	Pitcairn
PTR	Puerto Rico
QAT	Qatar
REU	Réunion Island
ROD	Rodriques Island
ROU	Romania
RRW	Rwanda
RUS	Russia
S	Sweden
SCN	St. Kitts and Nevis
SCN	Nevis
SDN	Sudan
SEN	Senegal
SEY	Seychelles
SHN	St. Helena
SLM	Solomon Islands
SLV	El Salvador
SMA	American Samoa
SMO	Western Samoa
SMR	San Marino
SNG	Singapore
SOM	Somalia
SPM	St. Pierre and Miquelon
SRL	Sierra Leone
STP	São Tome and Principe
SUI	Switzerland
SUR	Suriname
SVK	Slovakia (Slovak Republic)
SVN	Slovenia
SWN	Swan Island
SWZ	Swaziland
SYR	Syria
TCA	Turks and Caicos Islands
TCD	Chad
TGO	Togo
THA	Thailand
TJK	Tajikistan
TKL	Tokelau
TKM	Turkmenistan
TMP	East Timor
TON	Tonga
TRC	Tristan da Cunha
TRD	Trinidad and Tobago
TRD	Tobago
TUN	Tunisia
TUR	Turkey
TUV	Tuvalu
TZA	Tanzania
UAE	United Arab Emirates
UGA	Uganda
UKR	Ukraine
URG	Uruguay
USA	United States
UZB	Uzbekistan
VCT	St. Vincent and the Grenadines
VEN	Venezuela
VIR	Virgin Islands (U.S.)
VIR	St. Johns
VIR	St. Thomas
VIR	St. Croix
VRG	British Virgin Islands
VRG	Virgin Gorda
VRG	Tortola
VTN	Vietnam
VUT	Vanuatu
WAL	Wallis and Futuna (France)
YEM	Yemen
YUG	Yugoslavia
ZAI	Zaire
ZMB	Zambia
ZWE	Zimbabwe

Areas with no symbol:

Borneo
Canary Islands (Spain)
Macedonia
Montenegro
Serbia
St. Martin
Taiwan

WORLD TIME ZONES



STANDARD TIME ZONES

Corrected to May 1990

Boundaries are approximate.

Daylight Saving Time (Summer Time), usually one hour in advance of Standard Time is kept in some countries.

Standard Time = Universal Time + value from table

	h	m		h	m		h	m		h	m		h	m
Z	0		E*	+ 5	30	K	+ 10		O	— 2		U	— 8	
A	+ 1		F	+ 6		K*	+ 10	30	P	— 3		U*	— 8	30
B	+ 2		F*	+ 6	30	L	+ 11		P*	— 3	30	V	— 9	
C	+ 3		G	+ 7		L*	+ 11	30	Q	— 4		V*	— 9	30
C*	+ 3	30	H	+ 8		M	+ 12		R	— 5		W	— 10	
D	+ 4		I	+ 9		M*	+ 13		S	— 6		X	— 11	
D*	+ 4	30	I*	+ 9	30	N	— 1		T	— 7		Y	— 12	
E	+ 5													

‡ No Standard Time legally adopted.

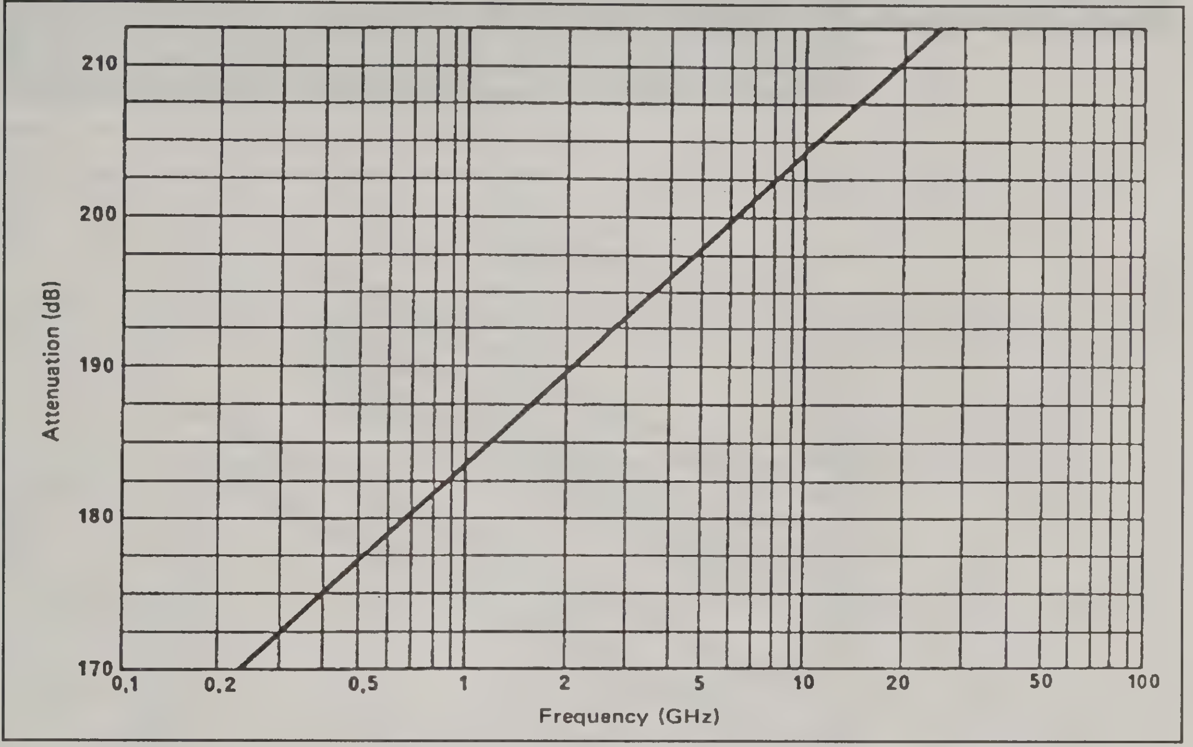
The world is divided into 25 major standard times zones, each nominally 7½° wide in longitude, but with actual boundaries very irregular and following political boundaries. Several areas of the world have official time zones that are one-half hour different from adjacent zones. (The interior of Greenland, and Antarctica, have no official time zone(s), but specific settlements in these areas may have their own standard times.) The official designations of the time zones are given in the accompanying chart.

The worldwide standard for time is Greenwich Mean Time (GMT), also called GMT, Z, Zulu (Z), Universal Time (UT), and Coordinated Universal Time (UTC). GMT is the standard time at longitude 0°.

Locations west of Greenwich have times earlier than GMT; locations east of Greenwich have times later than GMT. For locations not listed, the local mean time T (approximately the time a sundial would show at that location at longitude L) may be found by the formula $T = \text{GMT} + L/7½$, where longitudes east of Greenwich are considered positive, those west of Greenwich are considered negative.

Note that in summer months many areas are advanced one hour compared to their zone standard time. This is referred to as Daylight Savings Time in the United States, and usually as Summer Time in other parts of the world. Note also that the definition of "summer months" varies from area to area, and in some countries not all areas go on Summer Time. In the U.S., those states which do use Daylight Savings Time do so from the first Sunday in April until the last Sunday in October.

FREE SPACE ATTENUATION



This graph shows the free-space attenuation (also called space loss) between isotropic antennas separated by the distance of a geostationary satellite from the subsatellite point. The free-space attenuation between a geostationary satellite and an earth station located on the satellite's horizon will be about 1.5 dB greater.

In general, free-space loss may be calculated from the formula:

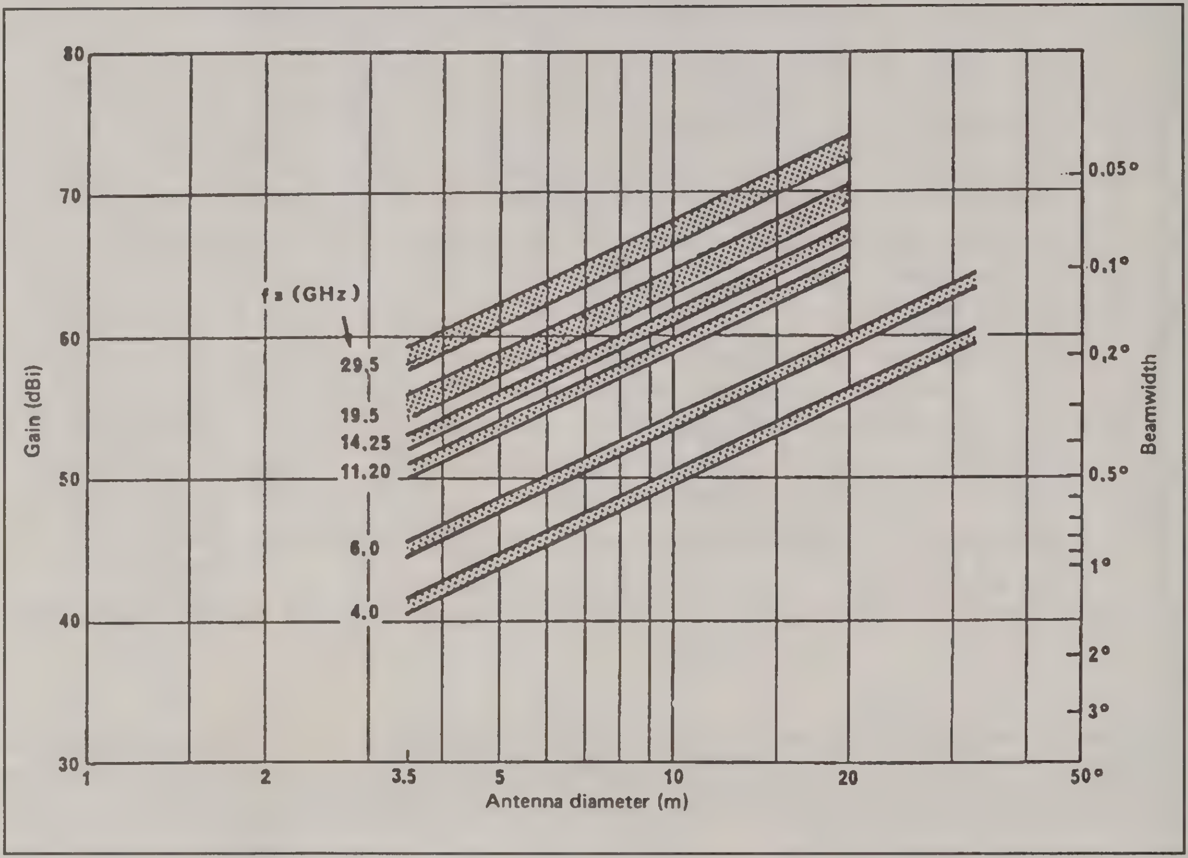
$$L = K + 20 \log S + 20 \log f$$

where f is the link frequency in gigahertz (GHz), S is a unit of distance, and K is a constant dependent upon the distance unit used. If S is measured in kilometers, $K = 92.5$; if S is in statute miles, $K = 96.6$; if S is in nautical miles, $K = 97.8$.

In addition to free-space attenuation, there is also link loss due to the atmosphere in clear-sky conditions and during rain storms.

Source: ITU

ANTENNA GAIN AND BEAMWIDTH



The graph shows, for various antenna dish diameters in meters, the gain in dBI (on the left vertical axis) and the half-power (3 dB) beamwidth (on the right vertical axis). For any diameter, there is a small range of values for these, depending on the efficiency of the dish. The ranges shown are for typical earth stations.

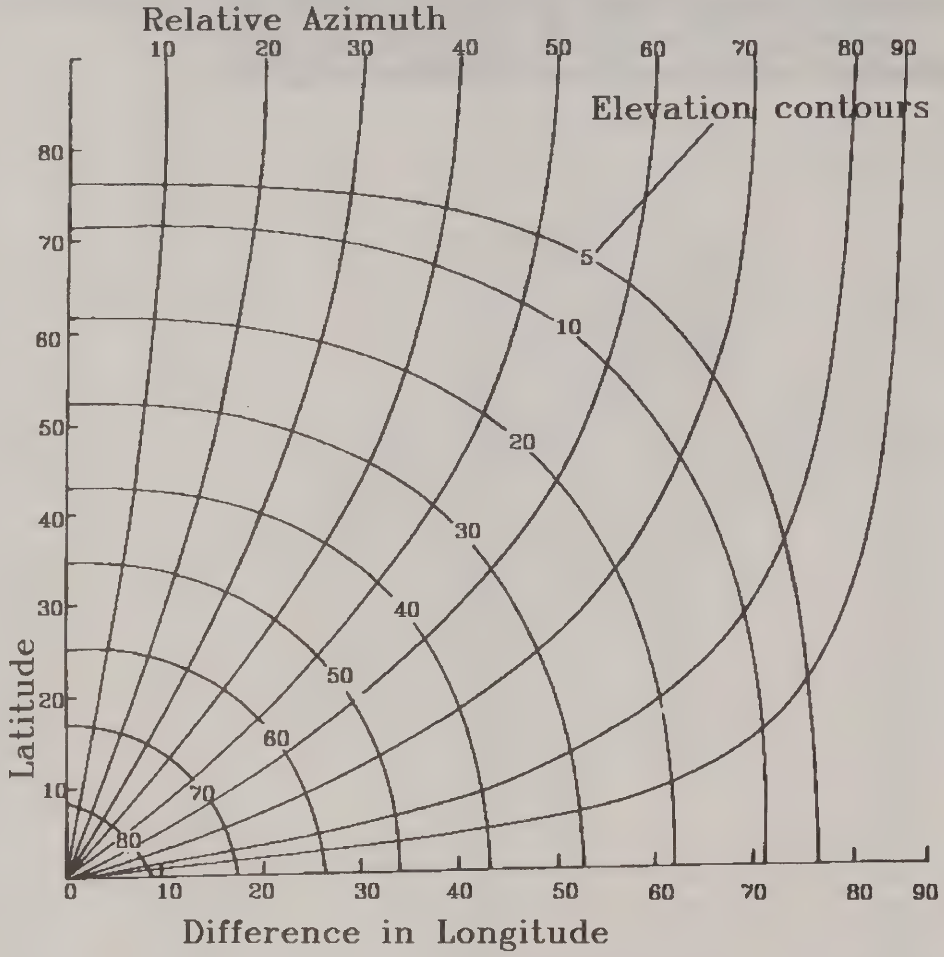
Source: ITU

LONGITUDE DIFFERENCE RANGE (DL) VISIBLE AS A FUNCTION OF LATITUDE

(for a minimum elevation of 5°)

Lat°	ΔL°	Lat°	ΔL°	Lat°	ΔL°
0	76.5	26	74.9	52	67.7
1	76.5	27	74.8	53	67.2
2	76.5	28	74.7	54	66.6
3	76.5	29	74.5	55	66.0
4	76.5	30	74.4	56	65.3
5	76.4	31	74.2	57	64.6
6	76.4	32	74.0	58	63.9
7	76.4	33	73.8	59	63.1
8	76.4	34	73.6	60	62.2
9	76.3	35	73.4	61	61.2
10	76.3	36	73.2	62	60.2
11	76.2	37	73.0	63	59.1
12	76.2	38	72.8	64	57.8
13	76.1	39	72.5	65	56.5
14	76.1	40	72.3	66	55.0
15	76.0	41	72.0	67	53.3
16	76.0	42	71.7	68	51.5
17	75.9	43	71.4	69	49.4
18	75.8	44	71.1	70	47.0
19	75.7	45	70.7	71	44.2
20	75.6	46	70.4	72	41.0
21	75.5	47	70.0	73	37.0
22	75.4	48	69.6	74	32.1
23	75.3	49	69.2	75	25.6
24	75.2	50	68.7	76	15.3
25	75.1	51	68.2	76.5	1.2

ANTENNA POINTING



This graph may be used to estimate the elevation and azimuth angles of a particular satellite seen from an earth station. Input data needed are the latitude of the earth station and the difference between the satellite longitude and the earth station longitude (noting whether the satellite is east or west of the station.)

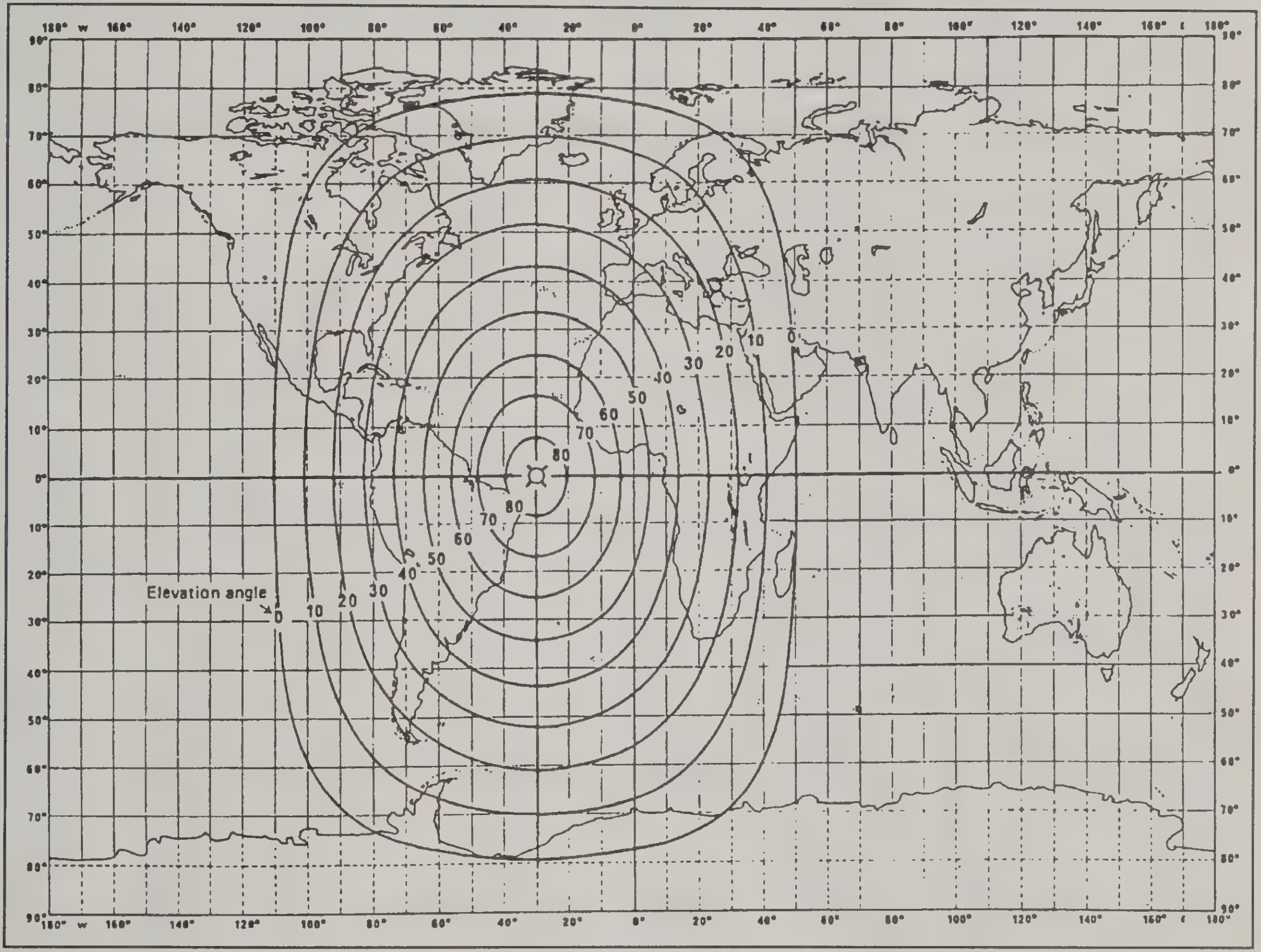
To use the graph, draw a horizontal line across from the earth station latitude. Then draw a vertical line up from the longitude difference. The intersection of the two lines is a point which shows the elevation and relative azimuth. Elevation angle is ready by estimating the position of the point between the roughly-concentric lines labelled "elevation contours." Relative azimuth is read by estimating the position of the point between the lines radiating from the origin.

Note that the azimuth thus obtained is relative to south for earth stations in the northern hemisphere, and relative to north for earth stations in the southern hemisphere.

For earth stations in the northern hemisphere, true azimuth may be calculated as follows: for satellites east of your longitude, subtract the relative azimuth from 180°; for satellites west of your longitude, add the relative azimuth to 180°.

For earth stations in the southern hemisphere, true azimuth may be calculated as follows: for satellites east of your longitude, relative azimuth is equal to true azimuth; for satellites west of your longitude, subtract the relative azimuth from 360°.

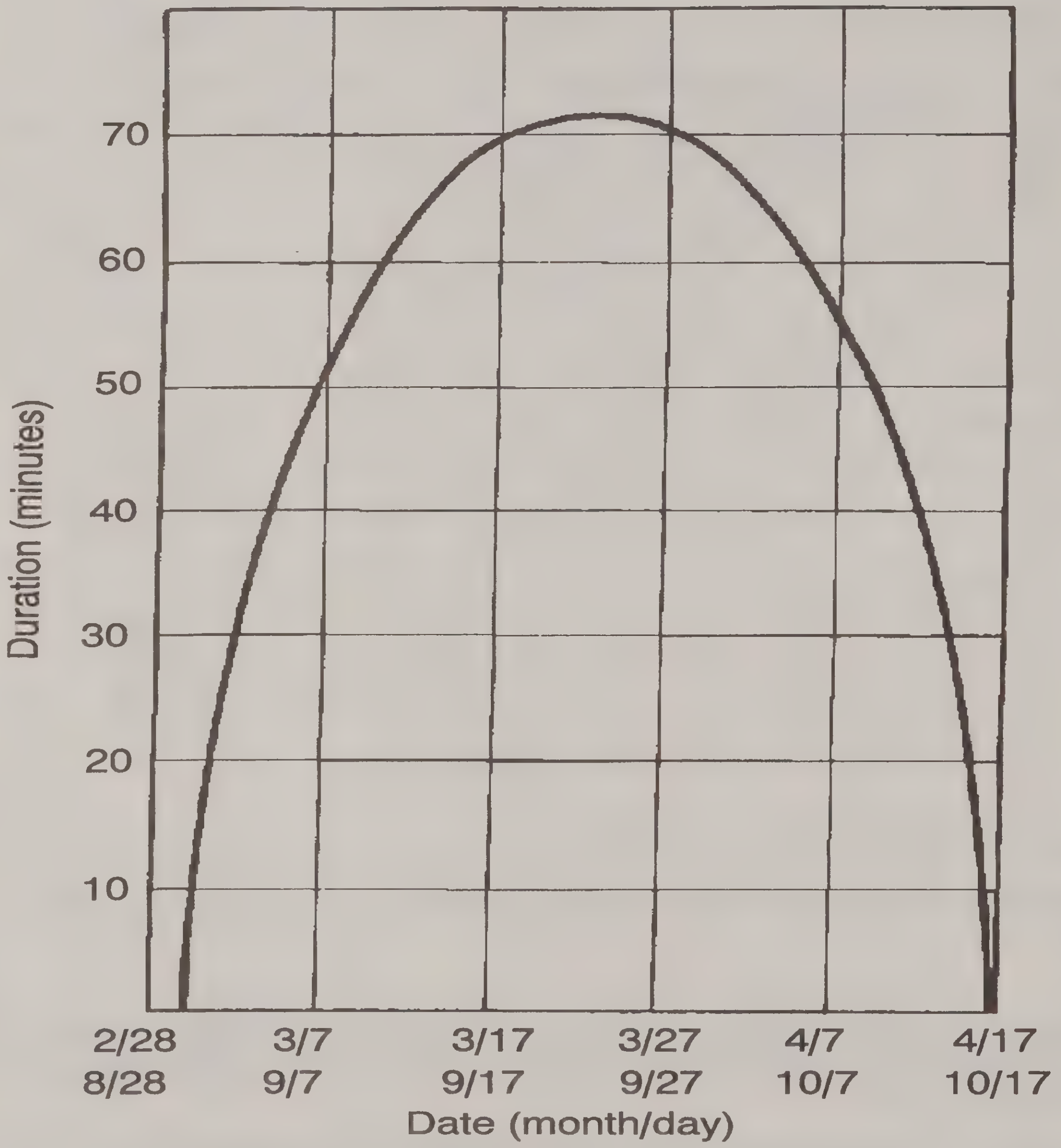
RANGE OF COVERAGE AND SATELLITE ELEVATION FOR A TYPICAL SATELLITE



The relationship between a satellite at some other longitude slot and an earth station may be estimated by making a photocopy of this diagram onto a transparency or film, and then positioning it with the satellite at the longitude of the satellite desired.

Source: ITU

ECLIPSE DURATION (FOR 50% SHADOW)



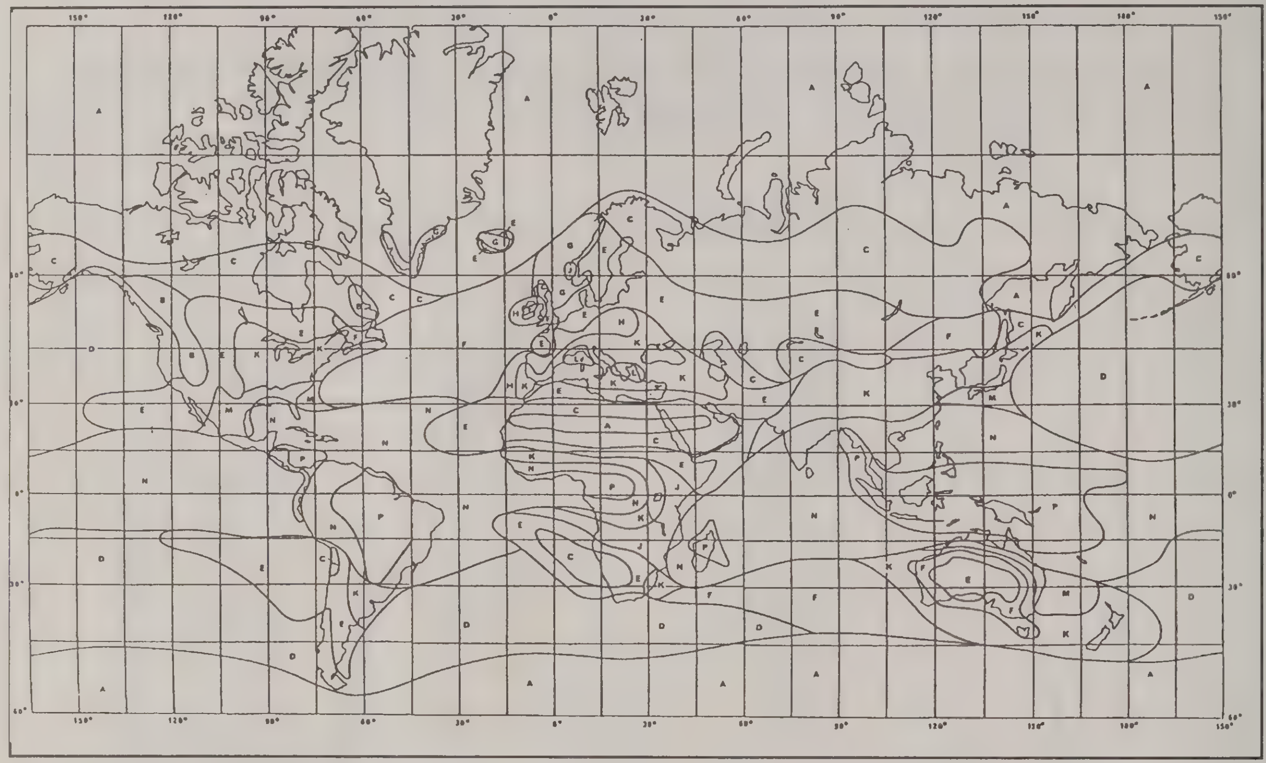
This graph shows the approximate duration of solar eclipses for satellites in the geostationary orbit as a function of the date. The duration given is the length of time during which the satellite is exposed to sunlight less than 50% of the uneclipsed intensity.

APPROXIMATE DATE OF PEAK SOLAR OUTAGES

Solar outages occur about five days either side of the dates of peak outage given. The dates of the outages, and the length of each day's outage will vary by a day or so depending upon the details of the earth station antenna beamwidth. The date will also vary by one day in leap years.

Station Latitude	**Spring Outage**	**Autumn Outage**
+60°	February 28	October 13
+50°	March 2	October 11
+40°	March 5	October 8
+30°	March 8	October 5
+20°	March 11	October 1
+10°	March 14	September 27
+0°	March 18	September 23
-0°	March 22	September 19
-10°	March 25	September 15
-20°	March 30	September 11
-30°	April 2	September 7
-40°	April 5	September 4
-50°	April 8	September 1
-60°	April 10	August 30

RAIN CLIMATE TYPES — ITU MODEL

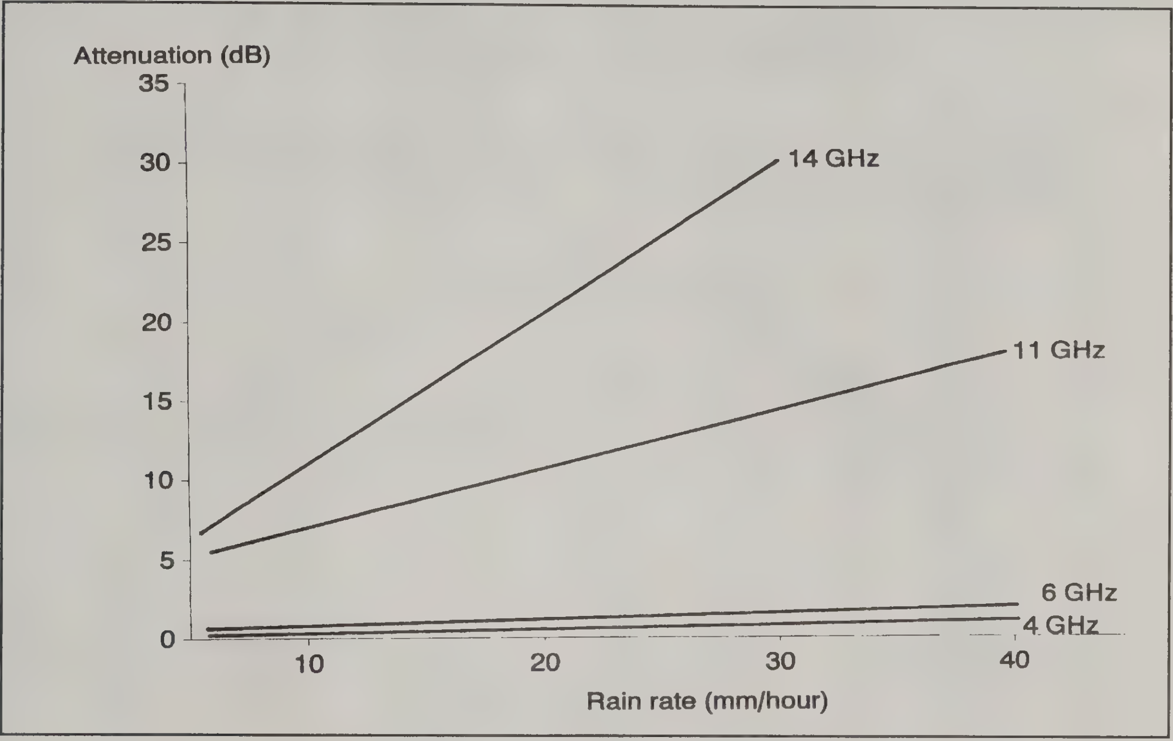


The map shows the rain climate types using the ITU model. The table below gives the percentage of a year during which a particular rain rate is exceeded for each climate type.
(For example, in a Type A climate, during 0.1% of the year the rain rate is greater than 2 mm/hr.
There are 8760 hours in a year; 0.1% of a year is thus 87.6 hours.)

Source: ITU

Time (%)	A	B	C	D	E	F	G	H	J	K	L	M	N	P
1.0	<0.5	1	2	3	1	2	3	2	8	2	2	4	5	12
0.3	1	2	3	5	3	4	7	4	13	6	7	11	15	34
0.1	2	3	5	8	6	8	12	10	20	12	15	22	35	65
0.03	5	6	9	13	12	15	20	18	28	23	33	40	65	105
0.01	8	12	15	19	22	28	30	32	35	42	60	63	95	145
0.003	14	21	26	29	41	54	45	55	45	70	105	95	140	200
0.001	22	32	42	42	70	78	65	83	55	100	150	120	180	258

RAIN ATTENUATION (FOR 5º ELEVATION)



This graph gives the approximate attenuation of radio signals in decibels for various rain rates, at four typical satellite communications frequencies, for earth station recommended minimum elevation angle of 5º.

NOISE TEMPERATURE TO NOISE FIGURE CONVERSION

Noise temperature *T* in kelvins; Noise figure *N.F.* in dB

T	*N.F.*
0	0.00
5	0.07
10	0.15
15	0.22
20	0.29
25	0.36
30	0.43
35	0.49
40	0.56
45	0.63
50	0.69
55	0.75
60	0.82
65	0.88
70	0.94
75	1.00
80	1.06
85	1.12
90	1.17
95	1.23
100	1.29
105	1.34
110	1.40
115	1.45
120	1.50
125	1.56
130	1.61
135	1.66
140	1.71
145	1.76
150	1.81
155	1.86
160	1.91
165	1.96
170	2.00
175	2.05
180	2.10
185	2.14
190	2.19
195	2.23
200	2.28
205	2.32
210	2.37
215	2.41
220	2.45
225	2.49
230	2.54
235	2.58
240	2.92
245	2.66
250	2.70
255	2.74
260	2.78
265	2.82
270	2.86
275	2.90
280	2.93
285	2.97
290	3.01
295	3.05
300	3.08
305	3.12
310	3.16
315	3.19
320	3.23
325	3.26
330	3.30
335	3.33
340	3.37
345	3.40
350	3.44
355	3.47
360	3.51
365	3.54
370	3.57
375	3.60
380	3.64
385	3.67
390	3.70
395	3.73
400	3.76
500	4.35
600	4.87
700	5.33
800	5.75
900	6.13
1000	6.48
1500	7.90
2000	8.97
2500	9.83
3000	10.55
4000	11.70
5000	12.61
6000	13.36
7000	14.00
8000	14.56
9000	15.06
10000	15.50
15000	17.22
20000	18.45
25000	19.41

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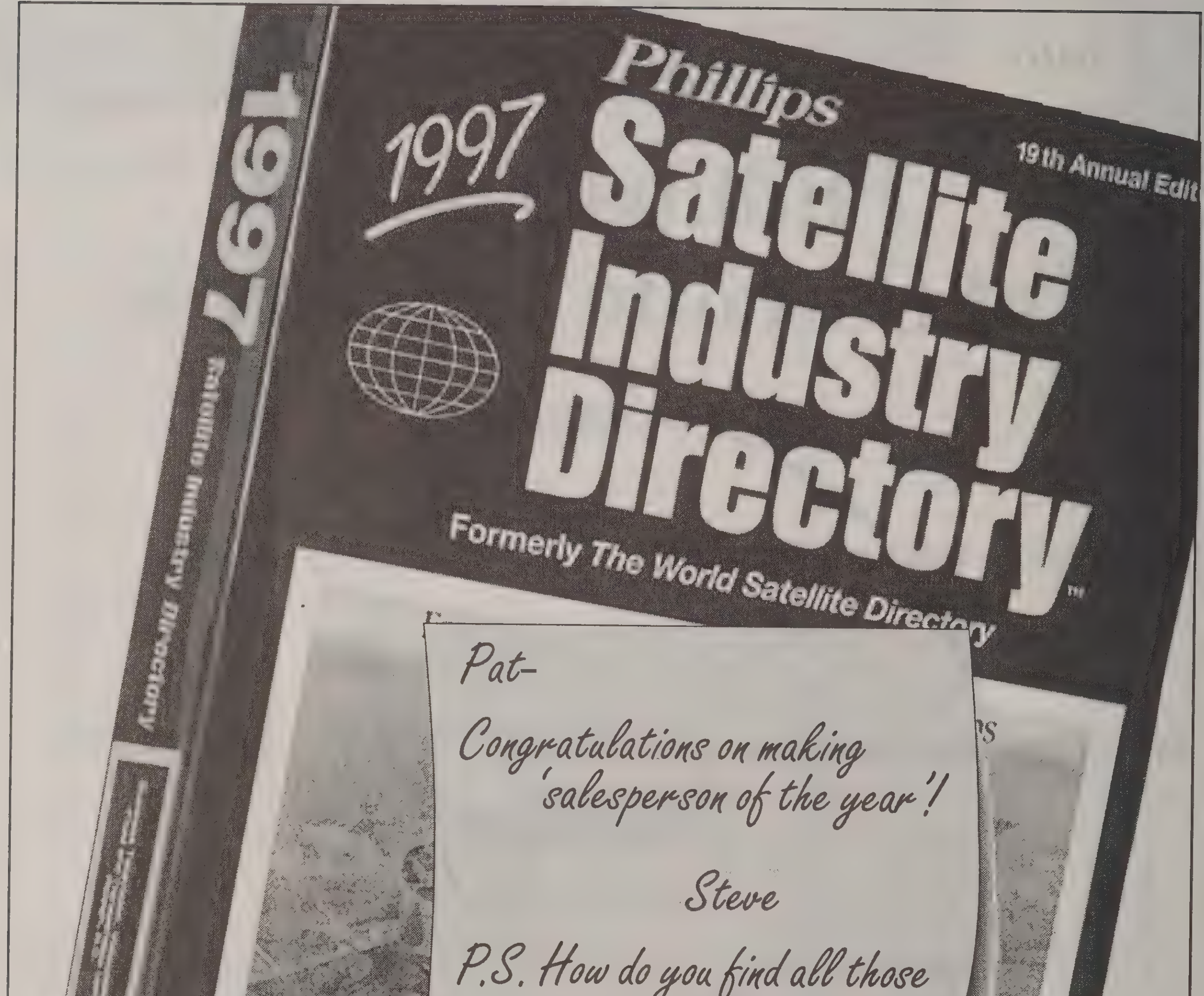
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glob·al (glo'bel) *adj.* **1.** Comprehensive; total scope or range. **2.** Of, relating to, or covering the entire earth; worldwide. **3.** Telecommunication Science. Of or relating to transmission, or connection. **4.** Having the shape of a globe. **--glob'al·ly** adv.

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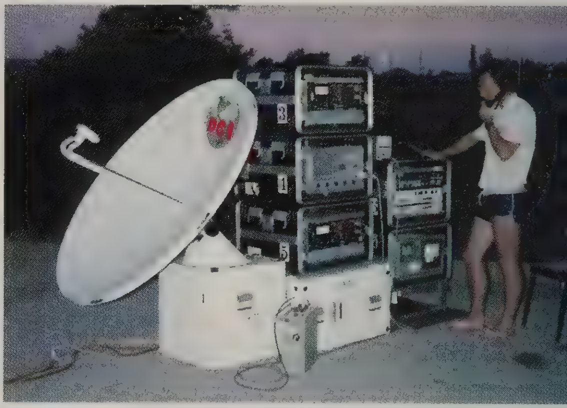
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GENERAL INDEX

Advance Entertainment Corporation ... 530
Advanced Communications Corporation ... 530
Air Force Space Command ... 296, 530
Alascom Inc. ... 191, 530
American Mobile Satellite Corporation (AMSC) ... 196, 530
Antrix Corporation Limited ... 530
APT Satellite Company Ltd. ... 80, 530
Arabsat (Arab Satellite Communications Organization) .. 370, 530, 540
Asia Broadcasting and Communications Network Plc. ... 522
Asia Cellular Satellite (ACeS) ... 312
Asia Pacific Mobile Telecommunications Satellite Pte. Ltd. (APMT) ... 350
Asia Satellite Telecommunications Company Ltd. (AsiaSat) ... 380, 530
Atlantic Satellite Communications Inc. ... 530
Autotote Communication Services Inc. ... 530
BAF Communication Ltd. ... 530
BAF Communications Corporation ... 530
BAF Communications Corporation — European Sales and Services Ernatec ... 530
Binariang Satellite Systems Sdn Bhd ... 140, 530
B&P The Spaceconnection Inc. ... 530
Broadcast Satellite International Inc. ... 530
C2C Satellite Productions Inc. ... 531
Canadian Satellite Communications Inc. ... 531
CBS Inc. ... 531
CD Radio Inc. ... 333
Centrex Communications Corporation ... 531
Century III at Universal Studios ... 531
China Orient Telecomm. Satellite Company Ltd. ... 304
Columbia Communications Corporation ... 434, 531
Comite International Maritime ... 540
Commision of the European Communities ... 540
Comsat Corporation ... 199, 531
Conference of European Posts and Telegraphs ... 540
Constellation Communications Inc. ... 351
Conus Communications Inc. ... 531
Crawford Satellite Services ... 531
CSC Management Inc. ... 531
Cycle Sat Inc. ... 531
Dallas Fort Worth Teleport Ltd. ... 531
Deutsche Telekom AG ... 70, 532
Directsat Corporation ... 336, 532
DirecTV Inc. — A Unit of Hughes Electronics Corporation ... 203, 532
Diversified Communications Inc. (DCI) ... 532
Dominion Video Satellite Inc. ... 338
EchoStar Communications Corporation ... 205, 532
Educational Television Services ... 532
EFC Startime ... 532
Empresa Brasileira de Telecomunicacoes (Embratel) ... 28, 532
European Space Agency (ESA) ... 524, 532
Eutelsat (European Telecommunications Satellite Organization) ... 397, 532, 540
Fifth Dimension Communications Corporation ... 532
Florida Public Broadcasting Service Inc. ... 532
France Telecom ... 58, 532
Friendly Islands Satellite Communications Ltd. (Tongasat) ... 526
Gascom ... 324
GE American Communications ... 211, 532
GE Starsys ... 298, 532
Globalstar Ltd. Partnership ... 353
Group W Network Services ... 532
Gunner Communications Inc. ... 532
Guycom/Texas World Teleport ... 532
Hero Productions ... 532
Hired Gun Microwave Communications Inc. ... 533
Hispasat S.A. ... 173, 533
Holmdel International Operations Center — A Service of MTN-Maritime Telecommunications Network ... 533
Hughes Communications Inc. ... 248, 533
In Sync Uplink ... 533
Indian Department of Space ... 90, 533
Inmarsat (International Mobile Satellite Organization) 440, 533, 540
Intelcom Group Inc. ... 533
Intelsat (International Telecommunications Satellite Organization) ... 447, 533, 540
International Organization for Standardization ... 540
International Telecommunications Corporation Inc. ... 533
International Telecommunications Union (ITU) ... 540
International Telecommunications Users Group (INTUG) ... 540
Intersputnik (International Organization of Space Communications) ... 478, 533, 540
Iridium Inc. ... 356
Japan Business Television Inc. (JBTV) ... 533
Japan Satellite Systems Inc. (JSAT) ... 118, 533
K-Tech Communications ... 533
Kansas City Teleport ... 533
Kelly Broadcasting Systems Inc. ... 533
Keystone Communications ... 533, 534
Keystone Communications Corporation ... 534
Learfield Communications Inc. ... 534
Learnsat Systems Inc. ... 534
The Lone Star Television Network Inc. (LSTN-TV) ... 534
Loral SKYNET Satellite Services ... 268, 534
Loral Space & Communications Inc. ... 340
Mabuhay Philippines Satellite Corporation ... 320
Magnetech Corporation ... 534
Manhattan Microwave Communications Company ... 534
Maxat Ltd. ... 534
Media Casting Telecommunication Inc. ... 534
MicroNet Inc. ... 534
MicroNet Inc. — Southwest Region ... 534
Microspace Communications Corporation ... 534
Ministry of Communications (Korea) ... 135, 534
Ministry of Defense (Russia) ... 294
Ministry for Postal Services and Telecommunications (Russia) ... 158, 292, 535
Ministry of Post, Telegraph and Telephone (Saudi Arabia) ... 326
Ministry of Posts and Telecommunications (China) ... 51, 535
Minnesota Public Radio ... 535
Mobile Communications Holdings Inc. (Ellipso Corporation/Ellipsat International) ... 358
Mobile Video Services Ltd. ... 535
MTA Teleport, Muslim TV Ahmadiyya ... 535
MTI/The Image Group Inc. ... 535
Nahuelsat S.A. ... 2, 535
NASA Lewis Research Center ... 286
Networks Teleports Inc. ... 535
New England Satellite Systems Inc. ... 535
New York Network — State University of New York ... 535
Nippon Telegraph and Telephone Corporation (NTT) ... 124
North American CLS Inc. ... 535
Novanet Communications Ltd. ... 535
NSN Network Services ... 535
NTT Mobile Communications Network Inc. ... 535

Nuova Telespazio SpA 115, 535
Odyssey Telecommunications International Inc. 360
Optus Communications Pty. Ltd. 8, 535
Orbcomm Global L.P. 300, 535
Orion Atlantic L.P. 490, 535
PanAmSat Corporation 501, 536
Pasifik Satelit Nusantara (PSN) 318
Production & Satellite Services Inc. 536
Prostar 536
P.T. Mediacitra Indostar 316
PT. Pasifik Satelit Nusantara 536
P.T. Satelit Palapa Indonesia 103
Rainbow Network Communications 536
Rimsat Ltd. 536
Rosebud Productions Inc. 536
San Diego Teleproductions 536
Satellite Broadcasting Inc. 536
Satellite Communication Systems 536
Satellite Management International Inc. 536
Satellite Network Systems Inc. 536
Satellite Network Television Corporation 536
Satellite Service Company Ltd. 536
Shinawatra Satellite Public Company Ltd. 184, 536
Singapore Telecommunications Ltd. 328
Sinosat Communications Company 310
Societe Europeenne des Satellites (SES) 417, 536
Societe Internationale Des Telecommunications Aeronautiques 540
Southern Exposure Satellite Communications Inc. 536
Space Communications Corporation (SCC) 126, 536
Spacecom—Satellite Communications Services Ltd. 111, 537
SpaceCom Systems Inc. 537
Spaceline Communications Services GmbH 537
Spector Entertainment Group 537
STAR Satellite Television and Radio Inc. 537
Starbird Satellite Services 537
Sure Shot Transmissions Inc. 537
Swedish Space Corporation 179, 538
Synergistic Technologies Inc. 538
TAO 132, 538
Taurus Communications Inc. 538
Telecomunicaciones de Mexico 144, 538
Teledesic Corporation 362
Telefusion de France (TDF) 67, 538
Telenor Satellite Services AS 153, 538
Teleport London International 538
Telesat Canada 36, 538
Television New Zealand Satellite Services 538
Tempo Satellite Inc. 288
TMI Communications and Company Limited Partnership 48, 538
Turk Telekom — Satcom Department 429, 538
Videocom Satellite Associates Inc./Videocom Teleport Boston 538
Visionlink (Satellite Services) 538
Vista Satellite Communications Inc. 538
Volunteers in Technical Assistance 364
Voyager Telecommunications Inc. 538
The Wold Organization Ltd. 538
Worldspace Inc. 342

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ADVERTISER INDEX

ADL ... xi
Allen Communications ... xxii
Anacom Inc. ... xxv
Avcom of Virginia Inc. ... xx
Chaparral Communications Inc. ... Cover 1
Comsat RSI ... vi
Comsat RSI — Anghel Laboratories ... General Index Tab A
Conus Communications Inc. ... 531
Diversified Communications Inc. (DCI) ... General Index Tab B
Harris Corporation — Broadcast Division, Systems Operation ... ii
Hughes Communications Inc. ... viii
IDB Systems ... Cover 2 & i
Michigan Information Technology Network ... xxvi
MITEQ Inc. ... Contents Tab A
MLE Inc. ... xvi
Narda West an L3 Communications Company ... Covers 3 & 4
NEC America Inc. — Radio Communications Systems Division ... Contents Tab B
New England Satellite Systems Inc. ... xv
PanAmSat Corporation ... v
SSPA Microwave Corporation ... xxiii
Starlink Communications Inc. ... xii
Systems Technology Associates Inc. ... xxiv
T-Square ... xxi
Videocom Satellite Associates Inc./Videocom Teleport Boston ... 537
VISAT (Vertex Integrated Satellite Antenna Technology) — A Division of Vertex Communications Corp. ... xxvii
Washington International Teleport Inc. ... xix
Winegard Company ... xiii

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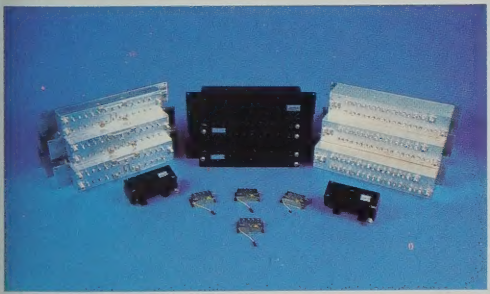
Narda West VSAT Transceivers (left) are designed for high linearity single-carrier and multi-carrier applications where maximum performance and reliability are mandatory. They meet the IESS 308/309 phase noise specification.



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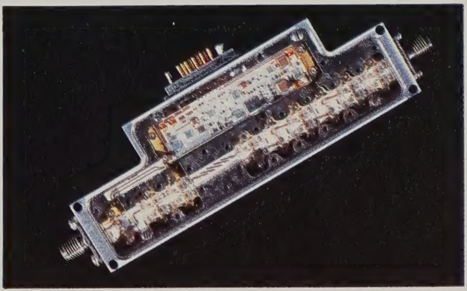
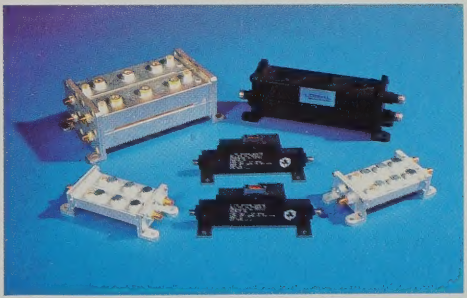


Inside View of a Space Channel Amplifier (above), Space Filters and Amplifiers (below)



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Filters/Multiplexers, Isolators/Circulators

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ECM	Instrumentation
Radar	Cellular Base Stations
Missile	Telecommunications

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- Payloads

Cavity Oscillators

COMMERCIAL
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GaAS FET AMPLIFIERS

SPACE
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